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THE NATURALIST;

A POPULAR MONTHLY MAGAZINE,

ILLUSTRATIVE OF THE

ANIMAL, VEGETABLE, AND MINERAL
KINGDOMS.

WITH OCCASIONAL ENGRAVINGS.

CONDUCTED BY

THE REV. F. O. MORRIS, B.A.,

Member of the Ashmolean Society, etc.

Author of "A History of British Birds." "A History of British Butterflies."

"A History of the Nests and Eggs of British Birds."

"A Bible Natural History." "A Book of Natural History," etc., etc., etc.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all: the earth is full of Thy riches,—PSALM civ., 24.

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NOTICES TO CORRESPONDENTS.

Communications have been received from MR. C. THURNALL;—ARTHUR HAVERS, Esq.;—MR. C. SMOOTHY, JUN.;—MISS J. E. WILKINSON;—JAMES S. WALKER, Esq.;—MR. JAMES BLADON;—MR. WILLIAM YELLOWLY;—FRANCIS WALKER, Esq., (two);—T. SOUTHWELL, Esq.;—MR. C. WALFORD, (two);—MR. JOHN WALSH;—REV. J. GREENE, (two);—J. GATCOMBE, Esq.;—G. H. TWINN, Esq.;—REV. H. HARPUR CREWE;—MR. S. P. SAVILL.

NOTICE TO ENTOMOLOGISTS.

For the future various matters connected with Entomology, will receive more attention in this Magazine than they have hitherto done. Promises of assistance in this department have been made by several able Entomologists. The Editor will be glad to receive contributions of a scientific character.

* * Correspondents are particularly requested to write the names of persons, places, and things VERY DISTINCTLY.

Volume I, Price 6s. 6d., and Volumes II, III, IV, and V, Price 7s. 6d., of "The Naturalist," may be had bound in cloth; and Cases for binding the Volumes at 1s. 6d. each.

Communications, Drawings, Advertisements, etc., to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York;—Books for Review and Parcels, to the care of Messrs. GROOMBRIDGE, 5, Paternoster Row, London.

TO ADVERTISERS.

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THE ENTOMOLOGICAL DEPARTMENT BY

C. R. BREE, ESQ.

VOL. VII. ~viii

WITH ENGRAVINGS.

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L O N D O N :
GROOMBRIDGE AND SONS, PATERNOSTER ROW.

M DCCC LVII.

THE NATURALIST.



THE STUDY OF NATURAL HISTORY CONDUCTIVE
TO HEALTH.

BY THOMAS FULLER, ESQ.

THE object of the following observations are intended more to establish the truth of the above proposition, than to furnish information upon the subject itself, in which I fear the little knowledge displayed will cause a smile from my readers: but with reliance upon the old homely proverb "that it is never too late to learn," I am encouraged to proceed, and, if not an apt, can at least testify to being a willing scholar, and of fully appreciating the labours of the talented Editor of the "Naturalist," and the interesting communications of his correspondents, towards leading the minds of others to a taste for the pursuit of a study tending so much to the acquirement of health and content.

Somersetshire, for rich and romantic scenery, is not inferior to any county in the kingdom. The Mendip and Quantock hills, with abundance of other elevated downs, where the purest air can be enjoyed as it comes fresh from across the Atlantic, stand in pleasing contrast with the rich and productive valleys. Luxuriant woods furnish shelter and protection to the feathered creation, particularly on the north-western side, bordering on the Bristol Channel, when nature assumes a grander appearance, with bold rocks projecting to the sea, and retiring bays richly wooded leading to enchanting vales. In these more favoured situations, the contemplation of birds, and other subjects of Natural History, might be carried on with advantage. My visits in this direction, though limited, have been quite sufficient to satisfy me that the lover of nature might here follow his favourite pursuit with success.

The ancient and elegant city of Bath, is too well known to require description. Situated at nearly the eastern extremity of the county, in a rich valley, through which flows the River Avon from east to west, on the north and south sides beautiful hills rise in gentle slopes, and then in bolder elevations, ascended by easy winding paths, affording enchanting views at every turn, and, upon reaching their summit, extensive and varied prospects. The population of the city and villages around is too numerous to

favour propagation of the feathered tribes, but notwithstanding this drawback, the book of nature is not a blank, and subjects of interest are not wanting to those possessing taste and inclination to seek after them. A life of industrial occupation leaves few opportunities for recreation, the theatre for the study of Natural History being essentially that of the fields and woods; with a mind at ease and in full command of time, few individuals engrossed in business find themselves in possession of these advantages, and until within the last few years such has been my situation.

Our immortal bard, in one of his never-to-be-forgotten soliloquies, has portrayed the life of man in seven ages. In my case five have passed; not all of them, it may be observed, in the same characters described by him, and however varied these may be according to position and occupation, the next admits of pretty general application.—

“The sixth age shifts
Into the lean and slipper’d pantaloon.”

It is at this period of life that the greatest of all temporal blessings, Health, is best appreciated as the only means of alleviating the pains attending that inevitable disease, old age, and beneficial as the investigation of nature is, at all seasons, it is never attended with greater advantages, than in this, the autumn of our existence. I have chiefly to thank the “Naturalist” and the charming freshness prevailing through the communications of its various correspondents, for inspiring me with a taste for, and inclination to follow this delightful pursuit. And here let me embrace the opportunity of earnestly recommending everybody, particularly those who, like myself, have passed the best portion of their lives absorbed in business occupations, to cultivate acquaintance with natural objects, and to lose no opportunity of studying the book of Nature. In so delightful a study the mind finds perfect relaxation, every page of this inexhaustible volume being full of interest, and pleasing reflections attend every line. Here is no complex subject to speculate upon and unravel; no difficult problem for solution; no doubtful proposition to argue, to the strain upon and exhaustion of the mental powers. On the contrary, natural presentations, simple and interesting, are replete with pleasure and satisfaction, cheerfulness waits upon every reflection, and every step leads to happiness, even winter, frowning winter, when as Thompson says,—

“How dead the vegetable kingdom lies!
How dumb the tuneful! Horror wide extends
His desolate domain.”

And as Dr. Johnson beautifully expresses it,—

“No music warbles through the grove,
No vivid colours paint the plain,
No more with devious steps I rove,
The verdant paths are sought in vain.”

Even at this inclement season, when sexagenarians like myself, are prone to seek comfort from closed doors and blazing fires, nature without presents sufficient attraction to draw us forth. Visitors peculiar to the season begin to arrive from still colder regions, and very little exertion brings under our observation Fieldfares, Redwings, and a variety of other strangers, to the benefit of our health, and increased enjoyment of our firesides upon returning home, whilst those who are fortunate enough to reside in retired rural situations, are gladdened with the nearer approach to their dwellings, of Blackbirds, Thrushes, and many others of our native birds, affording opportunities of feeding them, and of closer observation.

As spring advances, the lover of nature becomes full of pleasurable anticipations; he looks out for the Sky-lark, watches his soaring flight, and listens with lively satisfaction to his swelling notes. The appearance of the Swallow tribe is anxiously waited for, and the arrival of the various species carefully written down. The harsh cry of the Wryneck, the *avant courier* of the Cuckoo, gives notice of his approach, and the country round soon abounds with his welcome, though monotonous note. Numerous other birds follow, whilst Blackbirds, Thrushes, and many others of our constant residents, hitherto silent, open their little throats, filling the air with their music, and making the woods ring with their songs. Now is the time for full enjoyment of the country, and happy, thrice happy, are they who have the good fortune to reside in the rural districts.

(To be continued.)

DESTRUCTION OF BIRDS.

BY O. S. ROUND, ESQ.

IN the September No. of "The Naturalist," there is an article by Mr. Thomas Fuller, upon the "Scarcity of Birds" in particular districts, involving the difficult question, "how far their destruction is necessary?" With regard to the question of their destruction through mere wantonness or ignorant superstition, this we may of course dismiss at once, as indefensible; but, on the other hand, I am afraid that, were the natural checks to undue increase removed, (one of which I take cats to be,) it would be subversive of natural economy, and this too, in a state of things where even greater checks are rendered necessary. What I mean is this, suppose this country were an Arcadia, and man, subsisting upon the spontaneous products of the earth, roamed at will, unharmed and unharmed, it is obvious that both cats and birds would be vastly more numerous than at present; cats then would prey upon birds, and in their turns have, probably, as many enemies at least, as at present, and we know very well that no

domestic animal has so many. We all admire "poor pussy," she is our earliest playmate, gentle, pretty, and useful as a mouser, but she has the lion's nature, she is still of the order *Felis*, and in reality a wild beast, and where opportunity occurs, the wild nature comes out, and she is therefore subject to the contingencies attending it, and, like other wild animals, is prolific enough to make the supply equal to the demand.

In the state of things I am supposing, the fruits of the ground would arise without tillage, and be gathered without labour and without being the exclusive property of any one, and hence such an equality of right would exist, that the birds would have the same title to the corn or the cherry as a rational being. But this state of things does not exist, and therefore, when time, and labour, and money are expended in the producing, although the natural territory of the bird may be, to a certain extent, invaded, and the natural supply lessened, still man labours for a return and is clearly entitled to it, and therefore if the numbers of birds remain the same, with a less field for their support, the question arises, are they to be supported to his detriment? Now, if under these circumstances, some of them are destroyed, certainly this comes not either under the head of wanton or superstitious destruction, and although it may be a sad one, still it is a real necessity.

I know it has been said that Sparrows, or Larks, or Buntings, let them be ever so numerous, cannot consume sufficient to create any loss to the farmer; I have seen it otherwise, and it is notorious how pea-fields and fruit-gardens are often entirely stripped of their produce by these gentry. This is on the general question, and then comes that branch to which Mr. Fuller especially refers, namely, the indiscriminate destruction for some supposed object, and by too great a number of the feline race being kept. Now, with regard to "collecting" birds as specimens, my own notion is this; my earliest memories, and bright and pleasant ones they are, are associated with the contemplation of natural objects, and the contemplation only; I would sit for hours, (without metaphor,) watching the movements, habits, and appearance, both of birds and animals, and had no thought of appropriating or destroying them. Then came the time of boyhood, and with it, I confess, the destructive tendency common to that age, but as I soon became a bird-stuffer, and an "indifferent good" hand, I really had some excuse, but there was still the innate propensity to possess, and I fear that by gun and stone, (for I was an excellent shot with this latter primitive weapon,) I knocked down many a luckless songster which was not made any use of, and I look back upon that time with deep regret, and have always, and shall always do my best to prevent such useless cruelty in those of the same age.

I entirely agree with Mr. Fuller upon the destruction of our most

beautiful birds, both in song and plumage, and although I prize my small museum, had rather, a hundred times, sit and watch one of these lovely creatures as he did, than possess twenty as stuffed specimens. Putting it on the lowest ground, there is a beauty about a living bird, which no skill in preserving, nor taste in mounting, can ever restore, and I am convinced were this evil, for evil it certainly is, under some control, our choicest kinds would not be so fast vanishing from our eyes as they are. It is chiefly, however, I trust and believe, by the ignorant and coarse-minded that this wholesale havoc is made, for I am certain that did any one of common sense and feeling only allow himself to watch instead of killing, he would seldom or never kill.

I am convinced that the subject only wants consideration, to shew any one the true line. No doubt modes of preserving fruit and crops may be adopted, and are adopted, but with regard to natural enemies, it were almost impugning the natural order of things to call that in question, and when birds become "vermin," beautiful as they are, I fear they must meet the fate which vermin meet.

Pembroke Square, Kensington, September, 1856.

EXTRACTS FROM CORRESPONDENCE WITH A BROTHER NATURALIST.

BY FREDERICK M. BURTON, ESQ.

(Continued from page 221, vol. vi.)

Who is there that has not wondered at the curious circles so common in our English meadows, sometimes green and sometimes bare, called "Fairy Rings," and when we think of the tales of wonder we have often heard as children in connection with these weird impressions, it seems almost a pity that it should be so determinately settled that they are nothing but the work of eccentric fungi; but let us hear what a learned doctor of the seventeenth century has to tell us on the subject, in the good old days of witches and warlocks, and if it will not alter our ideas respecting their origin, it may perhaps tend to shew on which side of the nineteenth century we are to look for the golden age. I lately chanced to meet with an old book, printed in the year 1686, written by one Robert Plot, L.L.D., keeper of the Ashmolean Museum at Oxford, and Professor of Chemistry in that University, and dedicated to King James the Second, in which he lays down the law on the subject to his own and no doubt to his reader's satisfaction. I will give you the account in his own words:—"And here we will inquire into the efficient cause of those rings called 'Fairy Circles;' whether they are caused by lightning, or are indeed the rendezvous of

witches, or the dancing places of those little pigmy spirits, the Elves or Fairies." He then goes on to state that they are various in size and shape, and mentions having seen one near Birmingham nearly forty yards in diameter, that the rims of the circles are seldom narrower than a foot, or broader than a yard; and after a somewhat minute description of their shapes, he says, "Now that witches and wizards have sometimes their field conventicles, and that they dance in such rings, we have ample testimony from divers good authorities, who received it in confession from the criminals themselves, condemned by them." One of the authors alluded to was one Remigius, a Judge in Lorraine, "who," says the Doctor, "was the best skilled in matters of this nature that the world has ever yet known, having had the examinations, confessions, and condemnations of no less than nine hundred wizards and witches in fifteen years."

This same experienced Judge, in "a learned work upon the subject," describes one of these dances, how a damsel, returning from grinding corn, spied an assembly of these fairy Elves at their dance in one of these rings, some of which said Elves she could observe on close inspection "had cloven feet like oxen and goats, at which sight, she being sore astonished, called upon the auxiliary name of St. Peter to help her home, whereupon the Elves did all quickly vanish in the air," leaving, of course, the marks of their cloven feet and the circular limit of their ball-room. The damsel was very ill in consequence of the fright, and one of her antiquated neighbours was soon discovered to have been at the dance, and, on being apprehended, confessed, and was burnt. The Doctor did not, however, himself believe that the witches caused "the more part" of the circles, and after winding up the marvellous by saying that "herein every man is to choose his own creed," he proceeds to assign some causes for these curious rings, and says, "Some of them may be occasioned by Moldwarps, (Moles,) which may at a certain time of the year, by instinct of nature, work in circles, as 'tis certain Fallow Deer do in the time of rutting, treading the same ring for many days together. Others have fetched their origin from the dung of cattle, fed in the winter time at the same part of hay, falling always from them in due distance, and fertilizing the ground in a more than ordinary manner.

Others have them to be caused by the water, and hay itself, falling from the eaves of round hay-stacks plentifully in wet weather, and indeed it is possible that some of them may be made in either of these ways." But for the larger circles of forty, fifty, and sixty feet in diameter, he assigns a different cause. He says they abound in the parks near Oxford, and that he examined the soil under the rims of some of them to see how it differed from the adjoining earth, and found it much drier and looser, and the parts interspersed with a white hoar, much like that in mouldy bread,

and of a musty rancid smell, but to taste insipid, and this scarcely anywhere above six inches deep, the earth again below being of a due consistence, and genuine smell. He then says, "this must needs be the effect of lightning, which explodes from the clouds most times in a circular manner; it first singes the grass and makes it of a russet colour, but the year following of a dark luxuriant green, the earth underneath having been highly improved with a fat sulphureous matter."

So much for the learned Doctor's theories, at all events he must have been of an inventive turn of mind, and like a good lawyer, he knew how to assign a sufficient number of causes to one effect, so as to have something to fall back on in case of being deprived of his *status quo*. But at this time of the year, (February,) when the ground is once more covered with an old-fashioned coat of snow, and the roads stopped up with drifts, it seems out of place to be talking of fairy rings and green meadows. It is a long time since we have had so severe a frost, the birds are beginning to be wonderfully tame, and as fear gives place to hunger, they approach nearer to our windows, and become the more easy prey of that itinerant English vagabond the "hedge-popper."

It has often struck me as strange how the numberless troops of gnats, that appear with the first gleam of sunshine on a fine winter day, are preserved during the cold frosty nights from destruction, and I have often thought that like the chrysalides of moths and butterflies, which are exposed to the action of the weather above ground, and during seasons of cold become so hard as to break like glass, and on the return of warmth relax and live again, so it might be with these insects; and I have had the satisfaction of finding out that with some of them at all events this is the case, for one bright day last January I observed several flying up and down the panes of my window enjoying the warmth. Towards the afternoon a very sharp frost set in, and the heat of the room inside began to congeal on the glass, and caught one poor gnat that had been slow in discovering the change in the weather, and held it fast by the feet. Feeling the cold stiffening around it, it began to kick and struggle, but this only made matters worse, and it was presently fastened down flat on the glass in the most uncomfortable position, with its wings distorted, and every leg out of place. Next morning I discovered it in the same position, quite hard, and completely frozen through. Presently however the sun began to melt the coating of ice on the window, and I was glad to see the gnat revive with the returning warmth, and fly as briskly as ever up and down the panes. A severe winter like this, which to some is always a dreary season, is ever interesting to the naturalist, from the change wrought in the instincts and habits of animals by the inclemency of the weather.

Wild birds are driven inland, and some of those that dwell around us

congregate in vast numbers. In one of my late rambles I saw some Gulls feeding with a flock of Rooks in a newly-ploughed-up field, and some sheep, that ought to have been taken better care of, were obtaining their food, covered six inches or more with snow, by scraping each one a bare place on the ground with its feet, renewing their labour as often as occasion required. One of them was highly displeased with a piece of thorn that had got entangled in its long wool behind, and kept every now and then darting off at full speed as if trying to get rid of its persecutor; sometimes it stopped to take a side glance at the object of its alarm, and then with a kick and a bound set off again with renewed vigour.

Notwithstanding the intense cold the birds are not entirely silent; the Robin sings early and late, and to-day one was indulging in its loudest notes in the middle of a heavy snow-storm, doubtless in anticipation of the warm sun's rays, which soon after broke through the clouds; now and then also one may hear the "laugh" of the Green Woodpecker, and towards evening the musical caw of the Rooks, as they return home from their day's excursion, attracts attention. These birds are most regular in their winter habits here;—from about September to the beginning of March they congregate from all the neighbouring rookeries, and morning after morning set out in a body for the low marshy lands of the Welland, and regale till the evening, when as regularly they may be seen a little after dusk returning in a long straggling line to the place of rendezvous—Wardley Wood; those that arrive first invariably settle on the high ground overlooking the wood, and when all are assembled, at some given signal, they rise with one long caw, and settle for the night on the bare branches of the tallest oaks.

Uppingham, February 6th., 1856.

A PEEP AT THE FERNS, ETC., OF SUTHERLAND AND ROSS.

BY W.

RELIEVED for a time from the duties of office, I resolved to avail myself of a kind invitation to spend some days in Sutherland. I took the Orion steamer at Banff to Burghead, and thence proceeded by another boat to Little Ferry, near Dunrobin Castle. My course then lay along Strathfleet to Rogart. Here a few days were spent very pleasantly. On a rising ground behind the manse I met with *Lycopodium clavatum*, and among the broom the beautiful *Cemiostoma spratifoliella*. In a small loch about two miles to the north of the manse grows in abundance *Nymphaea alba*.

I was joined by a companion at the manse, and on Monday, August 4th., we started from Lairg for Durness. The road at first lies along the side of Loch Shin; it runs, on leaving Lairg, through a fine avenue of natural birch, interspersed with tall tangled patches of the more common Ferns, *Lastrea dilatata*, *L. spinulosa*, *L. oreopteris*, *Athyrium Filix-fœmina*; on emerging, it enters on bare, benty, low-lying ground, where we were greeted by the scream of the Curlew and the whirr of the Grouse. The country all along the loch has the same bleak appearance, and the hills on the opposite side are low, and rise in gentle round masses, their brown surfaces broken here and there by a house and its plot of tilled land. Near Shiness the land is cultivated, the only place along the loch, and many fine trees enliven the parks. As we proceed the view becomes more varied; in front, the hills rise in serrated masses, with Ben More Assynt far away in the distance, towering high over all. On nearing the end of the loch, and coming to the next in order, Loch Greim, the scene is wild and grand. The road appears to be barred up, and it is only on reaching a high point on the road that it is seen, running along the edge of the loch, at the foot of a hill, steep, rugged, and bare, with a few clumps of stunted birch hanging on its sides, while on the other side the hills rise in black heavy masses. Right cheerily did we wheel along the deep glen where Loch Markland, the next in succession, lies. We had on one hand the loch, backed by dark hills, with here and there a bare polished rock glistening in the sun, and their sides furrowed by torrents that dashed down in foam to the lake, and sent across in fitful notes their murmurs, softened by distance; and on the other, hills rising, sometimes steep, sometimes broken and jagged, and sometimes round, with the deep blue heavens spangled with white fleecy clouds, and a hot sun overhead, and the breeze coming from the hills in refreshing gusts. On reaching the watershed, a little beyond the loch, a scene singularly bold and beautiful is opened up. The hills in front rise black and frowning; their bases and half-way up their sides are strewn thick with rocks torn from their ribs, all huddled and heaped in terrible confusion—

“Cragg, knolls, and mounds confusedly hurled,
The fragments of an earlier world,”

overgrown with birch, whose dark foliage is in unison with the scene, while towards the summits their sides are almost perpendicular, broken up into an endless variety of pinnae and ridge, one here and there shining in the sun like the eye of the mountain's guardian god, looking out from his storm-rocked couch to admire and watch over the beauty and grandeur of his charge. Down the slope we swept, and round an overhanging cliff, some hundred feet high, to Loch More, that gradually displayed

itself, lying deep in its mountain bed, and breaking in sweet murmurs on its white beach, with the wavelets glittering, and playing, and dancing, as if in sportive gladness at the sweetness of its music, and in delight of its beauty, with Ben Stack at its head, like a giant,

“To sentinel enchanted land.”

The scenery along the loch is of much the same character as that along Loch Markland, only grander and wilder. The hills on the one side are steep, broken, and rugged, covered far up with birch, and undergrown with *Polypodium vulgare*, *Pteris aquilina*, *Lastrea dilatata*, *L. Filix mas*, and *Athyrium Filix femina*. On the other, they receded from the water in rounded masses, cleft here and there by deep ravines, till towards the head of the loch, where the rocks rise, at the water's edge, bare, bold, and bluff.

Horses were changed at the head of the loch, and we set off at a quick pace round the base of Ben Stack, through low-lying ground, along the side of a loch growing thick with *Nymphæa alba*. The ground shortly rises, and has an undulating kind of appearance, the rocks being a sort between gneiss and greywacke. We in a little time reached the highest point of the road, and then descended to Loch Stack. The road, cut partly from the rock, and built up partly from the loch, makes a sudden sweep, and disposes at once the whole lake,—a scene of wondrous wildness. The hills rise on the one side almost perpendicular for several hundred feet, here and there along the base strewn with huge rocks torn from the higher parts, and overgrown far up with birch, ferns, foxglove, etc., while the overhanging summits are broken up into every variety of form, now smooth, now round, now jagged, now jutting out in fantastic ridges, now seeming to topple over.

“The rocky summits, split and rent,
Formed turret, dome, or battlement,
Or seemed fantastically set
With cupola or minaret,
Wild crests as pagod ever deck'd,
Or mosque of Eastern architect.”

On the opposite side of the loch, the hills rise in every shape and colour, in deepening array,—round, steep, abrupt, serrated, peaked, deeply furrowed, white, grey, green, dark, mottled,—all bathed in a glorious sunshine, easting their deep shadows the one on the other, and forming a fairy sight of light and shape. Towards the end of the loch, the scenery becomes much tamer, and the road that lies between the loch and Laxford Bridge may be said to have a desolate and an uninviting appearance, passing through a part with a low, broken, bare, rocky surface. Beyond Laxford Bridge, the country loses its terrible sublimity, and assumes an

appearance of desolate grandeur; for a short distance the road runs at the foot of bare rocks along the edges of Laxford, that stretches away to the ocean between high steep cliffs; then toils up rising ground, through rocks, broken, twisted, and thrown up at all conceivable angles; then along a height whence a view of the country is got—a real picture of desolation; now down a steep descent; then round a projecting ridge; here along the end of a narrow glen, reaching far away between grey mountains; now along the edge of a loch; now round the shoulder of a hill; then along the face of another; now along the side of a torrent fretting its way among granitic boulders to some kyle, shewing its sparkling waters through some gorge in the hills; now up hill, and out on a heath dreary and lonely; then along past some lochs, amidst bare rocks, whose basins look like the vents of subterranean fires. Mile after mile of this wild desolateness passed away, wearying, and yet not wearying, the eye with looking; the same, and yet not the same; leaving on the mind an indescribable mixture of pleasure and wonder, not unaccompanied with a feeling of sadness, rising at times even to pain. By this time the sun was far down, and

“Each purple peak, each flinty spire,
Was bathed in floods of living fire,”

with here and there a cloud—now white, now dark, now red, now fringed with orange—sailing along their sides, or stretching from pinnacle to pinnacle, as if to form a bridge for the spirits of the warrior chiefs who once owned these lands. Before Durness was reached, night had clothed the hills in her sable folds, and the bold coast of the Atlantic Ocean was only seen in the dim distance.

Next day I set out to see the sights. The country round the townships of Durine and Sango is very rocky, mostly of limestone, and very uneven, dotted in every direction with lochs. Not much is cultivated, and that part very slovenly; for the inhabitants, notwithstanding all that has been done for them by the Duke of Sutherland, are in a blissful state of primitive civilization. The hills towards the south enclose it in the form of a crescent, and on the north is the Atlantic Ocean, with a coast of great wildness. There is an almost endless variety of cliff, precipice, rock, kyle, and bay. Sometimes the rocks rise up like walls; sometimes in black twisted masses; sometimes in overhanging cliffs; sometimes they run out in long, sharp, precipitous ridges, often terminated by an isolated rock, that seems to stand as the guardian of its own ridge; sometimes they gently recede from the sea, and leave a bay of fine white sand, now and then strewn with huge black limestone rocks. Here the sea runs up a narrow gorge, with high, wall-like sides, with tremendous force and terrific roar; there it rushes through a narrow hole, in white foaming circles,

into a deep, dark, green pool—a forest of sea-weed; there, again, the rocks retire from each other, and the sea runs up for a good many yards, and forms a beautiful bay, with a cave at its head, for example, the cave of Smoo.

At times would I lean over a precipice, and watch the sea rolling, and tossing, and boiling, and foaming, and moaning among the broken, huddled, charred rocks a hundred feet below, with the White Sea Mews, like the ghosts of drowned men, hovering over the abyss—now light green, now deep green, now blue, now a mass of white foam, now green again, with a thin broken covering of foam—and uttering their mournful cries, as if chiding the hungry waters for snatching so many from the bosoms of their happy families; with farther out to sea a Cormorant, now sitting as if in an easy chair on the wavy ridges, as they chased in each other to dash themselves against the opposing rocks; now diving below, and rising far from where it sunk; and now and then the Rock Pigeon flying past with the speed of the wind. After enjoying my fill of the grandeur of the scene, I would scramble away among the rocks, and down almost to the water's edge, in search of caves. Here is one. All around the rocks are black, as if burned, some lying loose, some lying flat, others standing perpendicular; here a large hollow worn out by the action of the water, and there, round a jutting rock, gapes the cave, like some monster. In I crept, and groped about among water-worn stones, round large smoothed pieces of projecting rock, now standing erect, now tumbling, now stooping into some black corner. But here is another narrow opening. Is this another farther in? Let us look. I am seated squat on the slippery rock, peering into a dark, deep recess, with scarcely a ray of light penetrating. Shall I enter? A strange sort of feeling sets upon me, a feeling, I suppose, experienced by most people on entering places of a like kind. I crawled in, and, lo! a magnificent dome of about thirty feet high, with a large piece of white quartz shining in the apex. I heard nothing save the dull dead dash of the Atlantic wave, wasting its fury on the rocks outside, and felt only the tremor of the rocks, as the heavy billows broke over them, and a cold, damp chill I never before experienced began to creep over me. I satisfied myself with looking, and left full of wonder and awe. But the Cave of Smoo surpasses all the others. The rocks round it cannot be less than two hundred feet in height. The cave itself is said to be eighty feet high, and is of a circular form. On the east side is a fine natural arch, and on the west is a long, dark passage, lightened by a large opening in the roof, through which passage a mountain stream runs, that tumbles through another opening further inland, on the opposite side of the road that leads from Tongue. On the surrounding rocks, and within the cave, grow *Scolopendrium vulgare*, *Asplenium trichomanes*, *A. ruta-muraria*, and *Cystopteris fragilis*.

To the west of Durness lies the beautiful bay of Balnakiel, with its old church and churchyard close on the margin of white sand. Here live numbers of Oystercatchers, and on the moorlands above the sea, further to the west, lives the Golden Plover, while in the lochs that are scattered about in such profusion are to be found Eels, Trout, and (in Loch Borley) Charr, (*Salmo umbla*.) Around the margins of some of them grow, to the height of two and three feet, *Equisetum limosum*. At the south end of Loch Crosspool, near the Manse, I picked off the limestone rocks *A. ruta-muraria* and *A. trichomanes*, and from the same rocks I procured some specimens of *Clausilia nigricans*. Among the rocks close to the water's edge grows *Equisetum palustre*, and a little further up, in a path leading to the Manse, *Equisetum arvense* in great richness.

(To be continued.)

ON THE ASCENT OF CADER IDRIS, FROM BARMOUTH.

THIS morn I heard a strain among the hills,
 So sweet and yet so wild, it seemed
 To fill my inmost soul with ecstasy,
 And listening to its melody, my spirit swelled,
 As if 't would burst the massive circling folds
 Of some vast tangent cloud that pressed upon it:
 And yet there were no outward sounds;
 The voice that spake was that of Nature,
 Or of Nature's God.
 A fresh breeze, springing from the Western Sea,
 Danced lightly o'er the blades of heathy grass,
 Blending their gentle heads one way,
 While patchy shadows of the sailing clouds,
 That scarce along the valley seemed to creep,
 Shot up the mountain's smooth and slanted sides,
 And o'er its barren summit disappeared.
 The wild bee, soaring from the plains below,
 And wheeling past with rapid droning flight,
 Scarce caught the ear with sound, ere it was gone.
 Save this, and echoing from the upland meads
 The faint and lazy tinklings of the bells
 Worn by some vagrant leaders of the herd,
 Uninterrupted silence reigned supreme.
 Above, clear out against the sky, two buzzards sailed,
 And crowned the loftiest peak with circling curves;
 While stealthily, in contrast to their graceful flight,
 A solitary raven, full of dire intent,
 Slow flapped with lagging wings from space to space.

[I have inserted the above at the request of a correspondent, but I have on hand a superabundance of "plain prose" for the time to come.]

The sun had now attained its midday course,
 Since first I crossed the Mawddaeh's rippling wave,
 And skirting by its southern shore, past Arthog's Falls,
 Across the moorland decked with heath and gorse,
 The purple heath flower and the yellow gorse,
 Had climbed the lofty crag of Towr Mur.
 Here turning round to gaze, a nobler view
 Of purest Nature, blest by God's munificence,
 Than that which lay beneath, I never saw.
 The river, filled to silence by the tide,
 Lay like a still cold serpent far below,
 While in and out among its wooded isles
 Long lines of sea-fowl winged their steady flight;
 Beyond, the everlasting mountains reared their crests,
 With peak on peak, and height succeeding height;
 While, stretching far to north, a yellow line of sand
 Skirted the sea's illimitable plain,
 Whose waves, refracted by the midday's sun,
 Twinkled incessantly with starry gems of light.
 Here having gazed, with mind insatiate I turned,
 And passing o'er a brown and heathy wold,
 Well stored with saxifrage and horned moss,
 I reached the base of Cader's barren crest.
 Not far from hence, (so ancient shepherds tell,)
 On a bare lofty peak that stands alone,
 The last of Cambria's eagles lived and died:
 The crag is still the safe abode of birds,
 Where, unmolested, they may rear their young.
 From hence unto the summit of the mount,
 One vast chaotic mass of broken rock,
 In wild confusion tossed, lay scattered round,
 And scarce a break or sign of life appeared,
 Save where a gushing stream with magic touch
 Transformed the leaden grey to living green.
 This passed, the long-expected height was gained;
 But how describe the scene:
 I gazed not merely at each object there,
 Noting them down in memory's sure page;
 I saw, and felt again that power,
 That earnest secret longing after good,
 That something unattainable, which oft,
 Amid the wild and fever'd dream of life,
 When thirst for gain and thoughts of earth are stilled,
 The burdened heaven-born soul of man desires.
 Speak out, ye everlasting hills, and tell,
 'Mid all your glorious beauty, what Creation's Lord
 Has done to mar your messages of love.

Long time I gazed,
 Standing above the dark and dizzy precipice
 Which flanks the northern brow of Cader,
 A sheer descent, eight hundred fathoms deep,
 A riven wall of stone, where dwell secure
 The ravening birds of prey, and at its base,
 Beyond the loose debris, a still, dark lake.

Down this descent a narrow path is shewn,
Where, it is said, the mountain foxes climb;
And stirring tales of chase, that ne'er grow old,
Are oft related by the hardy mountaineers,
And listened to with breathless, shuddering awe.
They tell how once a well-known wary fox,
That oft had slain the choicest of the herd,
Was roused from out his hidden lair of fern,
Down in the woods that skirt the Mawddach's shore;
How right away it fled, close followed by the pack,
Whose music, echoing from the distant rocks,
Brought ready huntsmen from their cottage homes,
A motley crew, on horseback and on foot,
Bold cragsmen, well inured to the chase.
With shout and wild halloo they sped along,
And first across the lowlands held their way,
Past copse, and fell, and cavernous ravine,
Past many a wooded glen and wild retreat,
Past heath and moorland, where the curlew feeds,
Past busy scenes, and scenes of joyful mirth,
Past homes of mourning, sorrow, and disgrace,
Past many a tarn and rippling mountain brook,
Where, like a shadow, glanced the wary trout,
Past hamlet, and the quiet churchyard graves,
Where, heedless and unheeded, lay the dead:
And thus for many a winged mile they sped,
Till hounds and huntsmen, wearied with the chase,
Exhausted, one by one gave up pursuit,
All save one staunch hound, which still pressed on,
And gained upon its prey, which then essayed
To climb the mountain's brow—its last resource.
And now, with lolling tongue and panting sides,
Right up the steep ascent they slowly pressed,
Pursuer and pursued in close companionship;
With wistful eyes each passed the rippling stream
Which gushes from the summit of the mount;
A moment more, and almost side by side
Over the fearful precipice they sprang.
The next day, safe upon a jutting crag,
By those who went in search, the hound was found;
While far down at the base, a shapeless mass,
Among the loose debris, the fox lay dead.
And now the sun had reached its western bounds,
And, as it sank beneath the level of the sea,
Shot forth a radiant path of light
Over the quiet ripple of the waves, as if
To kiss the earth once more, then disappeared;
And long before I reached the plains below,
From dell, and vale, and wooded glens arose
The opal mists of eve.

K. C.

COLLYWESTON SLATE.

BY FREDERICK M. BURTON, ESQ.

WHENEVER any particular locality possesses something of interest not attainable elsewhere, any account, though even the most bare and unscientific, from those who have access to it, becomes worthy of perusal, and it is for this reason that I venture to send the following lines to "The Naturalist:"—But before alluding to these Slate pits, it will be advisable shortly to state the general formation of the strata in this neighbourhood. Uppingham is situated on a small outlier of the Lower Oolite, the junction of which with the Lias is plainly manifest in many places. This outlier is formed most probably by the great mass of the Oolite having been in ancient days partially swept away by some vast river or arm of the sea, leaving the Lias exposed beneath; and this supposition is warranted by the general appearance of the surrounding country, which lies in long smooth furrows from west to east, and presents evident traces of denudation. It terminates to the west of Uppingham, just outside the town, but in the opposite direction it stretches towards Stamford, to the distance of eight or nine miles; it is nowhere very wide, the greatest breadth, that opposite Collyweston, to the north of the Welland, being not much more than a mile and a half. Shortly after leaving Uppingham to the east, the great bed of the inferior Oolite is succeeded by the higher strata of the system, alternate bands of sandstone and concretionary limestone, under which the former dips, the inclination being to the east, and on Barrowden Common, a bed, or rather single layer of a large Oyster, (*Ostræa Marshii*), is found uppermost, in some places not more than twelve inches from the surface. As you approach Collyweston, you leave this outlier to the north, and crossing the River Welland, which runs over beds of Lias, you come to the general mass of the Lower Oolite formation, and there we find strata which are not to be met with in any other part of the kingdom. Allied to the Slates of Stonesfield, they yet differ from them in some respects, the latter being situated at the foot of the great Oolite, while the former, though originally supposed by some to have been below the Fuller's Earth, are now ascertained by Professor Morris to be situated one hundred feet higher than the Stonesfield beds, at the top of the great Oolite, and equivalent to the Forest Marble of Somersetshire and other places.

The quarries are worked only in the winter time, as it requires the rains and frosts of that season to enable the slate to be split. The blocks, when first taken out, are on this account exposed in fields to the action of the weather, and in dry seasons watered to make them more amenable to the frosts. The slates when prepared are extensively used in this neighbour-

hood, and when first dug up they are of a light grey colour, which on exposure soon turns to a dark brown; they endure very well, and are more ornamental than the ordinary Blue Slates. The splitting is caused, says Professor Phillips, by organic exuviae, on which account, as you would naturally suppose, immense numbers of fossils are found imbedded, principally consisting of Trigonellites and Gervillidæ, one of the latter (*Gervillia Monotis*) being the characteristic fossil. I have also found there *Myacitis ninoniformis*, *Ceromya concentrica*, *Hinnites tegulatus*, *Pinna cuneata*, *Natica (Grandis, ?)* and the rare *Pteroceras Bentleyi*. A great deal of wood, sometimes in immense pieces, is found in the strata; and the layers of Slate often present ripple marks, rain drops, and tracks of crawling worms.

The laminations are pretty regular throughout, and the following is a section taken from the largest pits.

	ft. in.	DESCRIPTION.
The Carving,	4 0 . . .	Rubble.
Soft Cale, }	5 0 . . .	Irregular beds of Oolite.
Hard Cale, }		
Kiggling Course,	1 0 . . .	Beds more firm and compact concretionary limestone.
Ring Course,	1 0 . . .	do.
Bedding Sand, (with gigs,)	3 0 . . .	Indurated Sand.
Brood,	4 0 . . .	Oolitic, (not burnt for lime.)
Limestone,	1 6 . . .	Stone used for Lime.
Betch,	1 0 . . .	Irregular Sandstone.
Slate,	3 to 4 0 . . .	Fine hard, compact, shelly stone, readily split.
Fine Sand, (with gigs,)	14 to 18 0 . . .	Soft yellow sand
Red Sandstone,	Considerable depth.	

The Gigs, (so called by the workmen,) are discoidal masses of stone, exceedingly hard, imbedded in the sandy strata; they vary very much in size, some being not bigger than a cart wheel, while others are twenty feet or more in diameter. What these masses are, and how formed, perhaps some of your more scientific readers will explain; they are of a blue colour, and so hard that it is very difficult to break them with a hammer.

These Slate beds have never yet been found to the north of the Welland. On crossing that river, which runs, as before stated, through the Lias, you come again to the same outlier of the Lower Oolite, at its eastern extremity, at Ketton, which there consists of broad deep beds of the great Oolite rock, in much request for buildings, and presenting the following section:—

	ft. in.	DESCRIPTION.
Whitish Clay,	7 0 .	Thick Loam.
Crash,	4 0 .	Hard coarse Oolite of a red colour.
Guts,	4 0 .	Brown Oolitic stone.
Rag,	3 0 .	Oolitic.
Freestone,	4 0 .	Good Oolitic stone for building.
Rag,	as before.	

There are but few fossils found in these beds, which renders them of more value for the purpose for which they are required. Some *Pectens* and *Terebratulæ* are found in the Red Crash, and a few other shells, in the underlying strata, but the Freestone is almost entirely exempt from fossils of any description, and being, when first quarried, so easy to cut, and afterwards becoming so hard, it is much sought after, and is of considerable value to the owners.

Uppingham, October 14th., 1856.

SYSTEMA NATURÆ.

BY THE REV. P. O. MORRIS.

(Continued from page 286. VOL. VI.)

Sorex varius, *Schinz.*
Sorex cinnamomeus, *Licht. Schinz.*
Sorex pulchellus, *Licht. Schinz.*
Sorex carolinensis, *Bachm. Schinz.*
Sorex longirostris, *Bachm. Schinz.*
Sorex cinereus, *Bachm. Schinz.*
Sorex Dekayi, *Cooper, Bachm. Schinz.*
Sorex Cooperi, *Bachm. Schinz.*
Sorex fimbripes, *Bachm. Schinz.*
Sorex platyrhynchus, *Silliman, Schinz.*
Sorex surinamensis, *Pennant, Shaw, Schinz.*
Sorex *Lc Suerii*, *Duv. Schinz.*
Sorex himalaicus, *Gray, Schinz.*
Sorex nigricans, *Gray, Schinz.*
Sorex Dsi-Nezumi, *Temm. Schinz.*
Sorex umbrinus, *Temm. Schinz.*
Sorex platycephalus, *Temm. Schinz.*
Sorex talpoides, *Gapper, Schinz.*
Sorex mariquensis, *Smith, Schinz.*
Sorex poensis, *Fraser, Schinz.*

SOLENOTEN.

Solenoden paradoxus, *Brandt. Schinz.*

MACROSCOLIDES.

Macroscelides typicus, *Smith, Schinz.*
Rhinomys jaculus, *Licht. Darst.*
Macroscelides rupestris, *Smith, Schinz.*
Macroscelides Intufi, *Smith. Schinz.*
Macroscelides Edwardii, *Smith, Schinz.*
Macroscelides brevirostris, *Schinz. M.*
brachyrhynchus, *Smith.*
Macroscelides Alexandri, *Schinz.*
Macroscelides melanotis, *Schinz.*
Macroscelides Rozeti, *Wag. Schinz.*

MYOGALEA.

Myogalea museovitica, *Schinz. Mygale*
museovitica, *Desm. M. moschata*,
Brandt. Sorex moschatus, *Pall.*
Schreb.
Myogalea pyrenaica, *Fisch. Schinz.*
Mygale pyrenaica, *Desm. Geoff. Ga-*
lomys pyrenaica, *Wagl.*

TALPA.

Talpa europaea, *Schinz.*
Talpa cæca, *Savi. Bonap. Schinz.*
Talpa microura, *Hodgson, Schinz.*
Talpa Wogura, *Temm. Wieg. Schinz.*

SCALOPS.

- Scalops aquaticus, *Linn. Schreb. Schinz*
S. canadensis, Desm. Richards.
 Scalops Townsendii, *Schinz. S. cana-*
densis, Richards. Towns. Bachm.
 Scalops Breweri, *Bachm. Schinz.*
 Scalops argentatus, *Bachm. Schinz.*
 Scalops latimanus, *Bachm. Schinz.*

RHINASTER.

- Rhinaster cristatus, *Schinz. Sorex*
cristatus, Linn. Schreb. Richards.
 Rhinaster macrurus, *Schinz. Cordy-*
lura macroura, Harlan. Rich. Wag.
 Rhinaster longicaudatus, *Schinz. Talpa*
longicaudata, Erxleb. Cordylura
longicaudata, Harlan. Desm.

CHRYSOCHLORIS.

- Chrysochloris aurata, *Schinz. C. ca-*
pensis, Desm. Talpa asiatica, Linn.
T. inaurata, Schreb.
 Chrysochloris holosericea, *Licht. Schinz*
 Chrysochloris albostris, *Wag. Schinz.*
 Chrysochloris rutilans, *Wag. Schinz.*
 Chrysochloris villosa, *Smith, Schinz.*
 Chrysochloris hottentotta, *Smith, Schinz*
 Chrysochloris damarensis, *Ogil. Schinz.*

UROTRICHUS.

- Urotrichus talpoides, *Temm. Guerin.*
Schinz.

FAMILIA II.—CARNIVORA.

URSUS.

- Ursus arctos, *Schinz.*
 Ursus isabellinus, *Horsf. Fisch. Schinz.*
U. syriacus, Ehrenb.
 Ursus ferox, *Lewis & Clark. Richs.*
Prinz Max. Schinz. U. cinereus,
Desm. U. candescens, Griff. Fisch.
U. horribilis, Cuv.
 Ursus Americanus, *Pall. Richards.*
F. Cuv. Fisch. Schinz.
 Ursus Crowtheri, *Schinz.*
 Ursus ornatus, *F. Cuv. Fisch. Wag.*
Schreb. Schinz.
 Ursus torquatus, *Schinz. U. tibetanus,*
Cuv. Schreb.
 Ursus malayanus, *Raffl. Linn. Horsf.*
Cuv. F. Cuv. Griff. Schinz. He-
laretos euryspilus, Horsfield.
 Ursus labiatus, *Blainv. Desm. Sykes.*
Schinz. U. longirostris, Tied. Reich.
Bradypus ursinus, Shaw. Prochilus
ursinus, Illiger.
 Ursus maritimus, *Schreb. Blum. Cuv.*
Richards. Griff. Schinz. U. mari-
nus, Pall. Fisch. U. albus, Ross.
 Ursus longirostris, *Schinz. U. formi-*
carius, Eversmann.
 Ursus fructilegus, *Schinz.*

(To be continued.)

Miscellaneous Notices.

The Nightingale.—The very picturesque village of Thorpe, near Norwich, has long, from its quiet, thickly-wooded gardens, been a favourite habitat for Nightingales. I was strolling round the grounds of a friend there, on the evening of July 5th., when I was shewn a nest of this bird, built on a dwarf fir tree, certainly not more than three feet from the raised path. The song of the bird was not noticed till the second week of May—later than in former years; nor was the nest discovered till early in June, when it was complete, and contained eggs. Its “whereabouts” was made known by the partner’s sitting on a closely-adjointing fir, and singing softly in the afternoon and evening. Many eyes watched the birds and peered into the nest, but no such intrusion had any effect in

disturbing the birds, for they hatched and brought up four nestlings, which were frequently seen sitting with the parents on the spreading branches of their paternal tree; but no song was heard from the offspring, though instances have been authenticated of their very early indulgence in song. The exterior of the nest was formed of dry leaves of the lime, proving that, in the absence of oak leaves, this bird, like many others, adopts what is to be met with, and so "suits itself to circumstances".—GEORGE R. TWINN, Birmingham, October 2nd., 1856.

An agricultural gentleman I was recently visiting in Norfolk shewed me in his garden an apple tree, the lower part of the trunk of which had a hole about two feet and a half from the soil; a stick had often been thrust in, and found to travel down much farther, shewing the hollowness of the tree; the diameter of the opening was larger at the side of the tree than it was when once the hollow began to descend. In this hole a pair of Blackbirds stuck their nest, and plastered it securely in. One morning a burrow was found at the bottom of the tree, proving that a Rat must have been blocked up by the nest, and not liking "durance vile," had worked a passage out. Having no desire to remove his home, he kept to his lair at the foot of the tree, entering by the hole he had newly formed; but his days were doomed, after the discovery of his burrow, for he fell into the "tender embrace" of a deadly trap.—Idem.

As we were driving one day (July 11th.) by the gate of a corn-field, we stopped to gather an ear that was black with smut. Getting over the gate, we found a small pond on our left, thickly grown round with bushes, from which five young Kingfishers rose. I think we certainly are losing this bird from the vicinity of dwellings, for I enquired relative to its haunting a mill-stream, where I had, some few years ago, known it breed three times in the season, and found that now it was never seen there, nor could I get any information to form a conclusion as to the cause.—Idem.

I saw at the village of Runhall several specimens of the Fly Orchis, gathered by a cottager in her little paddock. She imagined she had found a prize, and so to her they were, for she conveyed the plants to a highly-respectable florist in Norwich, and received for them seeds useful for her garden. I also met with a fine bunch of the Canterbury Bell, with blossoms much larger than when under cultivation.—Idem.

Exchange.

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THE
NATURALIST;

A POPULAR MONTHLY MAGAZINE,

ILLUSTRATIVE OF THE

ANIMAL, VEGETABLE, AND MINERAL
KINGDOMS.

WITH OCCASIONAL ENGRAVINGS.

CONDUCTED BY

THE REV. F. O. MORRIS, B.A.,

Member of the Ashmolean Society, etc.

Author of "A History of British Birds." "A History of British Butterflies."

"A History of the Nests and Eggs of British Birds."

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O LORD, how manifold are Thy works! in wisdom hast Thou made them all: the earth is full of Thy riches.—PSALM civ., 24.

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* * Correspondents are particularly requested to write the names of persons, places, and things VERY DISTINCTLY.

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THE STUDY OF NATURAL HISTORY CONDUCTIVE TO HEALTH.

BY THOMAS FULLER, ESQ.

(Continued from page 3.)



There are many beautiful spots among the villages surrounding this city favourable to such objects, but, as before observed, the population being large, furnishes enemies persecuting them at every stage. It becomes necessary therefore, in order to reach more favourable situations, to undertake walks of somewhat greater length than the powers of one near entering upon the "sixth age" will permit him to accomplish with convenience. Nevertheless I sometimes manage to get over a tolerable distance, and am happy to say, with less fatigue than anticipated, no doubt arising from the beneficial effect of breathing the pure and health-inspiring air of our beautiful downs. In one of these walks to the westward a few days back accompanied by a friend, we heard the chattering of Magpies; my attention was immediately roused, and turning quickly to the direction from which the sound came, perceived three of my gay and lively favourites. We endeavoured with much caution to get near them, but the unfortunate persecuted creatures held the sight of man in too much dread to allow of any approach, and soon disappeared in the cover of an adjoining wood. My friend expressed equal pleasure with myself at their appearance, and cordially joined me in regretting the persecution and prejudice prevailing against them, which, he added, so far as his observations went, had increased to such an extent as to cause nearly the extirpation of the species: he also agreed with me as to the usefulness of this bird to farmers, and related an anecdote respecting one which his son brought last year from the Isle of Wight; thinking it may amuse my readers I repeat it:—

The young man being on a visit to a friend on the island, in one of his walks encountered a brood of young Magpies, and immediately gave chase; one of those thick fogs peculiar to the vicinity of the sea, prevailing at the time, the birds could not see the direction to their cover, so he succeeded in running down and capturing one of them, which he brought to the house he was visiting at. The bird soon grew familiar, making himself quite at home, and became a general favourite notwithstanding his mischievous habits. He had his liberty in and about the house; he was a most incorrigible thief, pilfering everything within reach in his power to carry away: reels of cotton, and all sorts of small articles he could manage to get hold of, were taken off and hid among his private stores. He was very fond of playing tricks upon the fowls, among others, he would approach the fowl-house with pieces of bread or meat in his beak, thrusting

it between the wires, holding it temptingly to the fowls and chickens, and when either of them ran eagerly towards it, he would draw it back in evident enjoyment of the fun, and run off with it to his own hiding-place. At the termination of the young man's visit he returned home, carrying the Magpie with him. A cigar box was converted so as to contain him, and in this Mag travelled to Bath. The journey was made through Salisbury, where some detention took place, when the box containing Mag was deposited, with other packages, upon a table in a room appropriated to the use of travellers. Whilst in this situation he made so loud a noise with his hard beak against the side of the box, as to alarm many in the room, some of whom concluded it to be spirit rapping, and no doubt would have gone away with that impression, if they had not been undeceived.

Upon reaching home Mag was quickly released from confinement, apparently none the worse, as he hopped about briskly, highly pleased at the recovery of his liberty. Food was brought to him, when a large cat—(this cat it should be mentioned is a remarkable fine one, an especial favourite, not only with individuals belonging to the family, but with visitors also; over the dogs attached to the establishment he reigns supreme, and is the terror of the feathered tribe about the garden and grounds: fowls and ducks are not spared, and in spite of all correction a victim frequently falls to his terrible claws; nevertheless his clean handsome appearance, with delicately striped fur, and his insinuating ways, cause all his depredations to be overlooked; latterly he has been invested with a bell fastened round his neck, which by tinkling with his slightest movement, gives timely notice of his approach, and affords opportunities of escape to numbers of his meditated victims.) This formidable animal approached Mag with stealthy steps and glaring eyes, bent on his destruction. The bird, nothing daunted, stood firm as iron, watching the movements of the cat, and regarding him with bold determination. After a few minutes puss slunk away, leaving Mag master of the field; he then made his repast in perfect self-possession, and having selected a projecting peg used for hanging harness upon, as a roosting-place, was left for the night.

Next morning Mag was introduced to the garden, of which a tame Gull had hitherto possessed the sole range, which Gull shewed no disposition to fraternise with Mag; neither did Mag bestow the slightest notice upon the Gull. This same Gull had been procured, at some trouble and expense, from a small rocky island in the Bristol Channel, for the purpose of destroying the snails and slugs abounding in the garden, but however serviceable his habits might be towards effecting that object, they were far outdone by Mag, and my friend says that it was with the utmost satisfaction he watched the vigour and activity displayed by Mag in dashing away the leaves from side to side and pouncing upon every snail and slug; he

was therefore welcomed as a great acquisition, and took high place in the favour of all, particularly with my friend, who was vastly delighted at the idea of having so able an assistant towards exterminating one of his greatest annoyances. But alas! these happy feelings were doomed to be of short duration. The next morning, upon going into the garden, poor Mag was discovered quite dead, by the side of a small tub of water which was sunk to a level with the ground, for the use of the Gull.

It appears that whilst the Magpie was at the Isle of Wight, he was accommodated with a shallow pan of water, in which he could stand and wash, flap his wings, dipping and raising himself up by his legs. It is surmised that, mistaking this tub for a vessel of similar depth, upon hopping into it his legs descended, and finding no resting-place, he had not the power of raising himself up; his wings must have been immersed, and in consequence, his feathers becoming heavy with water, the poor fellow sunk and was drowned. How he got out of the tub appeared at first mysterious, but it was soon accounted for, as when first seen the Gull was observed to be plucking and tugging at him violently, so that no doubt remained of his having been pulled out by the Gull.

But to return to our walk, which we continued under some hanging woods, into which a Blackbird every now and then sought shelter, as disturbed by our advance. We came back home by the side of the Avon, saw several Kingfishers, and were much interested in observing the rapid flight and quick evolutions of numberless Swallows.

Yesterday the same friend accompanied me in an excursion eastward. We ascended one of the hills on the south side of the city, and by crossing the elevated land called Hampton and Claverton Downs, we cut off a very considerable circuit in the valley, into which we descended again higher up the river, near the romantic villages of Monckton Coombe, and Limpley Stoke. The views in this neighbourhood are of surpassing beauty at all seasons of the year, and particularly so in the spring and summer, when the extensive woods are in verdure, and full of the songs of all kinds of birds, and here the Nightingale is still to be heard.

At this season of the year nearly all our songsters are silent, and we saw but few birds moving; my companion accounted for this, by saying that nearly all would be found in the stubble fields, where they congregate in great numbers. The note of the Robin was the only one heard; this general favourite will continue to sing through the winter; they were now answering each other from every side. Making our way to the banks of the river, which is here lined with trees, principally the alder and willow, we observed numerous gaudy butterflies, and the Kingfisher frequently glanced by displaying his brilliant colours. I was highly gratified at the sight of so many of these beautiful birds, both in this and our former

walk, and am led to hope that museums are nearly all supplied with specimens; happily their nests are made in places too difficult of access for marauding boys to get at them, so that some probabilities remain of this lovely bird being preserved to us. The shades of evening coming upon us sooner than we were prepared for, terminated our observations, and caused us to return by the shortest route.

Robins are singing nearly all day from the high trees near this house, and as cold weather comes on, would approach closer and become familiar, picking up crumbs of bread from the lawn and window-sills, were they not prevented by the prowling cats. Even now whilst writing, seated at a window opening to the garden, over which my eyes are frequently directed upon the look-out for anything on the move, I see one of these feline pests creeping onwards, with body depressed, close to the ground, head stretched forward, and eyes intent upon some object, some poor bird no doubt. Yes, there is a pretty Grey Wagtail running about the lawn, picking up insects from the short grass; the cat is now in the shade of a laurestina bush; a few more steps round it and the bird will be in his clutches: there goes a book at him, (the first thing I could lay hand upon,) missed him of course, but saved the bird.

(To be continued.)

ADDENDA TO BIRD-RETREATING.

BY GEORGE R. TWINN, ESQ.

I WAS much gratified with the perusal of the article "on the Scarcity of Birds in certain districts." I am sure it must be a great grief to every true lover of nature, that though many agencies promotive of this scarcity, are easy of remedy, yet ignorance and prejudice contrive to keep them "going," because, forsooth, they follow the error, that continuance of a folly or a wrong is a justification of it.

In my former paper, written at the close of May, the Spotted Flycatcher had not appeared in our grounds, but early in July it was proved to have been there some time, for the gardener and footman, under the plea of driving sparrows from the peas, amused themselves with a gun, and among their victims fell a poor Flycatcher. This led to a close search, and the result was, that in the identical hole of the wall in which Flycatchers had formerly built, was a nest with four young ones.

This autumn a pair has been shot from a party of upwards of a dozen; also a bird that has to be recorded as appearing here for the first time, the Tree Pipit, and which is in the hands of a bird-preserved. But it may occur to the reader, why complain of bird-retreating, when you appear

to lend a sanction to a cause? I reply, to seem, is one thing, to be, a far different. I am glad I have in no manner justified the destruction of these birds, merely for destruction, but to verify by actual specimens, that such have been obtained from our grounds. Nor are any of the domestics habitually employing fire-arms, but they fulfil the adage, "that the mice will play in the cat's absence;" hence our possession of the Pipit. We have a pair of Chaffinches permanently settled with us, and I have several times seen and heard a Whitethroat, though I presume its migration will soon ensue. The Redbreast at all periods of the day is enlivening us with his always pleasing song, and winning from us renewed love and care.

I fully concur with Mr. Fuller, that "boys are as destructive as cats." Are they not more so? Country boys are never so happy as when armed with a gun, and as for their depredations they are immense, as regards eggs. I met with an instance this summer of upwards of four hundred taken by one lad, the majority of them song birds.

Wholesale and thoughtless persecution is much to be censured; anything done for no higher or worthier motive than mere gratification is unnatural and unwise. The labours of a boy early arranging and collecting, thoughtfully reading and confirming his knowledge by habits of observation, and proper and lawful acquisition of specimens are to be commended, the germs of a future scientific naturalist are to be encouraged.

I have an idea, and it is founded on the intense pleasure all classes feel in hearing of the wonders of the vast kingdoms of Natural History, that were practical and outdoor lessons given plainly and attractively to the young generally, we should find ourselves repaid in seeing grow up around us a better and a wiser class of men, realizing the oft-quoted utterance of Coleridge:—

"He prayeth best who loveth best
All things both great and small."

Birmingham, October 2nd., 1856.

ON BIRDS USING OIL FROM GLANDS "FOR THE PURPOSE OF LUBRICATING THE SURFACE OF THEIR PLUMAGE."

BY THOMAS FULLER, ESQ.

THAT all swimming birds possess glands which furnish an oily liquor is well known, and it is generally believed that such oily liquor is used for lubricating their feathers and plumage for the purpose of resisting wet. Waterton, in his *Essays on Natural History*, when treating upon this subject, expresses himself entirely in opposition to such belief, and says,

that when birds are supposed to be employed in the operation of applying this oil, people are mistaken, and that the endeavours of the birds are towards the dislodging of vermin which constantly infest them. This opinion he stoutly maintains in his usual decided style of argument, in course of which he enquires—"Will any naturalist declare that he has actually seen a bird procure liquor, or oil, or whatever you may choose to call it, from the gland with its bill, and then apply that liquor, or oil, to its plumage? The gland has somewhat the appearance of a nipple upon its upper extremity; an oily liquor may be obtained from this nipple by applying our fingers to it, but I marvel how it can be obtained by the sharp-edged bill of a bird. When the nature of the gland, and the form of the bill are duly considered, it is rational to conclude that the application of the hard bill to the soft gland would be very painful to the bird. Let us here suppose that the bird has succeeded in getting some of the liquor into its bill; how is the liquor to be supplied to its feathers, they would merely come in contact with the edges of the bill, while the liquor would have sunk into the cavity of the lower mandible.

Suppose, for the sake of argument, that the bird does actually apply oil from the gland to lubricate the plumage, (which, by the by, I flatly deny) how is the head and part of the neck to be supplied with oil? Why, the truth is, they never can be supplied; and if you examine with the nicest scrutiny, the feathers of the body *within* the range of the bill, and the feathers of the head which are *out* of the range of the bill, and then compare them, you will not perceive the smallest difference in their downy appearance—proof positive that the plumage of the body has not been lubricated with oil from the gland."*

Having no pretensions to the title of "Naturalist," to whom this question is propounded, it is with much diffidence I offer any reply in opposition to the opinion of so close an observer of nature as Waterton, particularly as my field of investigation has been limited; but presuming the habit under consideration peculiar to all aquatic birds, observations upon one species must apply to others, and furnish a reply to his question. The following will therefore sufficiently justify my differing both from his premises and conclusion.

I have frequently watched Geese, and there is no difficulty whatever in lubricating those parts which Waterton says *cannot* be done. It is thus managed. There is no necessity for, neither does the bird get the oil into the cavity of the lower mandible; the bill is rubbed *over* and *against* the gland, and being well covered with the oily secretion, the same is transferred to the feathers on the back; the head and parts of the neck which the

* In the "Magazine of Natural History," volumes viii. and ix., Mr. Fuller will see that I have disposed of Mr. Waterton's arguments.—F. O. MORRIS.

bill cannot reach, is then rubbed over the parts where this extra quantity of oil is placed, so that by turning the head and neck on either side, all those feathers out of reach of the bill are as regularly and effectually lubricated as any other part of the body.

Waterton also remarks, "Granting glands to supply an oily secretion, a sufficient quantity could not be obtained to lubricate all the feathers."

Why not? It is known that the bones of swimming birds are not hollow like those of other classes, but are filled with oily marrow; and that the glands spoken of are well supplied, is evidenced by the appearance of these parts even after the death of the bird. Where then is the difficulty in believing the oily liquor to be supplied in sufficient quantity? Besides, it does not necessarily follow that so large a proportion is required at one time. The secretion being continuous, and the operation of lubrication frequent, removes that objection; and as to the extraction of the oil from the soft gland by the sharp bill of the bird being a painful operation, it is all nonsense, for it is evident the bill is not so used, but is merely rubbed against the gland as already described. The necessary state of lubrication is therefore accomplished without incurring any of the difficulties enumerated by Waterton; and without the defence of such preparation, how is the fact of water running off the plumage of birds like quicksilver to be accounted for?

Weston Road, Bath, October 10th., 1856.

ON UNITY OF SYSTEM.

"Thro' ceaseless change to seek th' unchanging."

THERE is a universal law of creation as beautiful as it is simple, and apparent throughout nature, and in all creatures, collectively and individually, and rising through successively higher manifestations, till it is lost to us in unrevealed mysteries.

This is the *law of degradation*, or of *subjection*, by which the cessation of one state or epoch, or at least the diminution of its most perfect condition must precede the development of the ensuing and higher degree of existence. By this law the means are continually more and more subject to the end, in which they at last disappear or cease. The examples afforded by Geology are very numerous, and a few are here selected, wherewith to commence the illustrations of this law:—

The earth during very many millions of ages was gradually cooled from an incandescent mass to its present state, and the latter part of this period was marked by numerous successive epochs, in which the great divisions of the animal, such as Radiata, Mollusca, Fishes, Reptiles, Birds, and

Mammalia, appeared and flourished in the said succession, and the species of each class having reached their perfection, or culminating point, dwindled or were degraded, and generally completely exterminated previous to the creation of smaller, fewer, and less highly-developed species of the same class, which were the contemporaries of the kinds of the next higher class, or higher forms of life, the latter being then for the first time distributed. Nevertheless, each epoch, whose average duration amounts to millions of years, is characterized by the presence of some creatures which are different from all the others, and represent, though in a slight degree, the creatures of the coming epoch.*

The whole of the earth had a warm climate during nearly all the period from the epoch of Mollusca to that of Birds. Every one of the thousands of species, and most of the genera of those ages have passed away, and the details of this part of the earth's history are full of examples of the law of degradation, and are all in accordance thereto.

Of the revolutions of the earth, in which its system was disturbed or convulsed, that which closed the Azoic age, or the period previous to the existence of living creatures, was probably most nearly universal.

The Radiata, Mollusca, Articulata, and Vertebrata appeared by some of their kinds in very ancient times, and the first three almost or quite together. The creatures of lower grade, such as Foraminifera, Medusæ, Confervæ, and Fuci, whose office it is to reanimate, and to recall into circulation more matter, are comparatively co-extensive with it, both as to space and as to time, and supply abundant nourishment for the numerous and voracious tribes of Mollusca, Crustacea, and Fishes.

The epoch of Mollusca, or the Silurian Period, continued for a long succession of ages, and with this class the Corals, the Crinoids, and the Trilobites were associated. Then the Coral animalcules built the limestone hills and mountains, and the Mollusca in size and organization far exceeded those of the later creation, but their degradation, and finally their complete cessation ensued. The last Trilobite lived in the seas of the carboniferous epoch, and the last Ammonite existed in the Reptilian Age. In vegetation, the epoch of sea-weeds only continued for a long time, and after its diminution, that of flowerless trees, (Tree Equisetæ and Tree Ferns,) and of the Pine tribe succeeded, to be in its turn degraded before the appearance of the present vegetation.

* I must here take occasion to adopt the stereotyped notice of the newspapers,—“The Editor does not hold himself responsible for the opinions of his correspondents;” and certainly, moreover, even after allowing, as I think may be allowed, a wide limit to the term “day” of creation, as we are so expressly told that “One day is with the LORD as a thousand years, and a thousand years as one day;” yet, I cannot conceive that any animals can have lived on the earth while only yet in the act of being cooled from an “incandescent state.”—F. O. MORRIS.

After the Mollusca æra appeared the Vertebrate class, of which the four great divisions, Fishes, Reptiles, Birds, and Quadrupeds, are organized according to one type. This was the Devonian Period, with which the Silurian is included in the age of Algæ, or of sea-weeds.

The Ganoid tribe of Fishes now existed, and continued till the middle of the Reptilian Age. The earliest Fishes having the most perfect organization, almost all passed away, and were succeeded by other kinds. The species of Fishes before mentioned being exterminated, the epoch of Amphibians and of Coal Plants, or the Carboniferous Age ensued. The lower division of Reptiles, such as the tribe of Frogs and of Salamanders, and those of immense size, now took the lead. These are most allied to Fishes, having gills when young.

Land had now appeared, and when the Amphibians flourished, the land plants were first in exuberant growth, and by cleansing the atmosphere from carbonic acid, made it suitable for the respiration of land animals. These plants (flowerless trees or Aerogens) and Coniferæ then disappeared, and the last *Lepidodendra* lived in the forests of the Carboniferous continents.

The Amphibians comparatively passed away, and the age of true Reptiles gradually appeared in all its grandeur. Reptiles larger than Whales inhabited the water, immense reptiles were on the land, and flying Reptiles in the air. But they began to decline before the close of the epoch, and the last flying Reptile and swimming Saurian existed in the Reptilian Age.

Thus the Mollusca, the Fishes, and the Reptiles successively passed their prime, and dwindled both as to number of individuals and as to rank of species. Each of these great epochs contained many lesser periods, in each of which there are subordinate examples of the law of degradation. The Mollusca, with their companions, the Corals, the Crinoids, and the Trilobites, were either wholly or more frequently partially exterminated, and were replaced by new kinds, and the same may be said of the Fishes and of the Reptiles, and the causes of such disturbances can be often traced. The age of Reptiles includes the periods between the Coal epoch and the Tertiary epoch.

(To be continued.)

A PEEP AT THE FERNS, ETC., OF SUTHERLAND AND ROSS.

BY W.

(Continued from page 13.)

AFTER exploring, to the best of my ability, the country round Durness, I resolved on an expedition to Cape Wrath. In company with the minister

of the parish, I started on Monday, 11th. August, to walk on foot a distance of thirteen miles. On landing on the opposite side of the Kyle of Durness, I espied some Ferns growing in the cliffs of the rocks. They proved to be *Asplenium adiantum-nigrum*, *A. trichomanes*, *Polypodium phegopteris*, and others of a more common kind. We were now fairly on our road; but, somewhat to our dismay, the clouds, which, during the morning, had hung in threatening aspect towards the east, began to give forth their contents in no ordinary quantities—in real Highland drops—and the wind to come in fitful gusts, driving the rain before it like snow-drift. We consoled ourselves with the fine view of the bay, and the thought that all would soon be over; but it only grew more and more stormy. It would be like cowards to turn, and on we held—like idiots, some may say.

The road for the whole distance is very dreary and ugly. The hills towards the south have in general a tame, rounded appearance, softened by the distance of several miles from the road. The intervening space is somewhat uneven, and mostly of a peaty nature, covered with heath and bent, a loch or two only breaking the dreariness of the scene. On the north side the ground is, for the most part, hilly, and shuts out the view of the sea, except at a part about five miles from the Cape, where the road rounds the shoulder of a hill, and comes in sight of the ocean. On we trudged, with the rain hissing and pelting against our drenched persons, now and then casting a look behind us, to examine the face of the sky. A wild sight it was! Landward, the hills were covered with a dark sort of haze; for about ten degrees above the horizon extended a space of a dun dirty white; above that the clouds were piled on cloud, blacker and ever blacker; sea-ward, the sky and water seemed to meet; mass after mass rose, and chased each other up the heavens in deep blackening folds, till the whole was inky black.

“——— ponto nox incubat atra.”

In our evil plight, we beguiled the time by speaking of “the light of other days,” and sometimes launching forth on hope’s wings to a sunny future. Things often go by contrast; we were in rain, and mist, and cloud—why should not the imagination run wild in sunny fields? Mine did so, and I began “biggin’ castles in the air,” to the forgetting of the storm. At last we got to the Lighthouse, “like to eat the wind for hunger.” Most hospitably were we entertained by Mr. and Mrs. Ewing, and most heartily did we enjoy our meal. A long road, a mountain air, and a merry heart make an empty stomach, and hunger makes the sweetest “kitchen.”

After viewing the Lighthouse, we stepped over the wall that surrounds

the building to view the Cape. But what pen can describe it? It would require one dipped "in hues of earthquake and eclipse." The Cape itself rises perpendicularly from the water to the height of four hundred feet, or thereabout, and runs away towards the east in rugged overhanging cliffs. Towards the west it runs for a few yards with a slight curve, and then juts out into a terrific cliff; from behind this runs outward to the sea a low ridge of rocks, rising in height to sea-ward, till it reaches, to appearance, the height of one hundred and fifty or two hundred feet, and affords shelter to numbers of Gulls. Further to the westward, the coast is a continuous line of high, rugged precipices.

After lingering along on the top of the rocks till the chill of our wet clothes warned us "to move on," we set our faces Durineward. If our morning's journey had anything disagreeable in it, it was amply made up for by the beauty of the afternoon. The storm had passed over, and was succeeded by that calm sweetness common after a heavy breeze. The air was balmy; the heavens were blue, streaked with *cirrus*, tinged with gold towards the sinking sun; the Bees hummed past; the Curlew screamed; the Plover sent forth his whistle; the Raven flew over our heads uttering his dull croak; and now and then was borne on the gentle breeze the sweet murmur of some streamlet, as it was flowing to its home in the ocean. On one side rose up the hills in bold relief against

"The summer heaven's delicious blue,"

all one sea of golden light, except where fell the black shadow of some hill. On the top of one sailed away the remnant of a cloud; there, over some dark, deep hollow, hung a thin white vapour, fine as a bridal veil; there again, like a necklace round some dark Eastern beauty, clung a fringe of glittering mist round a "summit hoar." Before us lay the ocean, broken in upon by high, bold headlands, some black, some white, some sparkling in the sun, with the Orkney Islands looming far off on the horizon. All this, combined with the lonely desolation of the scene, tended to soothe the mind, and lead away the thoughts to scenes of toil, and trade, and competition, and villany, and misery, and wretchedness, both the one and the other the effect of sin; and then far away into futurity, on the speculation that the time would come when ocean's fury should be tamed, and become the safe highway of nations,* and when those wildernesses should be brought under the strong hand of cultivation, when, in the words of the Prophet, "The wilderness and the solitary place shall be glad, and the desert shall rejoice, and blossom as the rose."†

We trudged along happy as kings, examining the Fern treasures of

* Do not our Lord's miracles of stilling the sea point to something like this?

† I am inclined to think that this will one day literally be fulfilled.

the road:—*Polypodium vulgare*, *P. phegopteris*, *Lastrea dilatata*, *L. spinulosa*, *L. oreopteris*, *Athyrium filix-fœmina*, *Pteris aquilina*, *Blechnum boreale*, *Asplenium adiantum-nigrum*, and *A. trichomanes*. We arrived at our lodgings a little after sunset, all dry and comfortable, and ready again for another meal of which we partook most heartily.

(To be continued.)

Miscellaneous Notices.

Grey Phalarope.—A very fine male specimen of this bird was shot this week in a neighbouring parish, about sixteen miles from the Solway.—W. G. GIBSON, 75, High-Street, Dumfries, December 17th., 1856.

Ringtail Harrier, (*Falco pygargus*.)—A female* was shot in the act of devouring a Partridge, at Foulmire, Cambridgeshire, November 29th., 1856.—S. P. SAVILL, 13, Regent-Street, Cambridge, December 10th., 1856.

Merlin, (*Falco æsalon*.)—One of these birds, an adult female, was shot at Cherry Hinton, Cambridgeshire, November 19th., 1856. Another, an immature male, at Green End, near St. Ives, Huntingdonshire, December 3rd., 1856.—Idem.

Little Auk, (*Alca alle*.)—On Thursday last, November 13th., a boy at Little Shelford, four miles distant from Cambridge, picked up, in an exhausted state, a good specimen of this bird. After a short time it seemed completely revived, and, when put into a tub of water, it was quite at home, and seemed much refreshed by its bath.—C. THURNALL, Newton, near Cambridge, November 15th., 1856.

Little Auk, (*Alca alle*.)—I have just discovered one of these birds lying dead on the surface of our river, forty or fifty miles from the sea. We have also had the Rose-coloured Starling and Hoopoe shot close to us.—C. SMOOTHY, JUN., Great Abington, Cambridgeshire, November 22nd., 1856.

Little Grebe, (*Podiceps minor*.)—A fine specimen of this bird, in the winter plumage, was shot while swimming in a pond near South Shields, on November 19th., 1856; it is now in my possession.†—W. YELLOWBY, South Shields, November 26th., 1856.

Scarcity of Birds in Hard Weather.—This subject was treated upon in "The Naturalist" last year, or, indeed, I believe, strictly speaking, two winters ago; for we have been visited so unusually early with a severe

* This bird is the female of the Hen Harrier.—F. O. M.

† It is a common bird everywhere.—F. O. M.

"storm," snow-blast, and frost, that we have, as it were, had two winters in one year. It "came in like a lion and went out like a lamb," having lasted eight days, beginning on November 28th., and ending on December 6th., I think. I never remember harder frosts, both black and white. The latter, as usual at this season of the year, were preecursors of rain, and the last continuing for a whole day, the trees were singularly beautiful, every spray of every bough being silvered over with the hoar-frost, as if all had come out into winter leaf, the verdure, so to speak, being of dazzling whiteness, glittering and sparkling in the sun. But the birds, as seems to be their wont now-a-days, almost one and all vanished—scarce a feather was to be seen. One used to think that hard weather drove the birds to us; now it seems to drive them away.—"The why and the wherefore?"—F. O. MORRIS, December 11th, 1856.

On the 28th. of November last, during snow and hard frost, I shot a Knot at Nunburnholme, on the edge of the stream by the village green. It was extremely tame. I put it up several times, and it alighted each time only a few yards off, while I went into a neighbouring cottage for a gun. I never before knew one myself so far inland—some five-and-twenty miles from the sea.—F. O. MORRIS.

Land Rail.—A fine one was taken alive by a woman at Shelf, near Halifax, late one evening in the beginning of November last. She had a lantern, and the bird followed her into a little walled enclosure near her cottage door, called a fold.—J. WALSH, Hipperholme, near Halifax, December 2nd., 1856.

Skylarks.—On the morning of Wednesday, November 26th., the neighbourhood of Halifax was visited by vast flocks of Larks. Many hundreds have been shot. They were so numerous that the air was partially darkened with them, and they were between one and two hours in passing over. Those killed were nearly all very fat.—Idem.

The Starling and Blue Tit.—In a garden in Church-road, Edgbaston, there are many trees of the mountain ash, well berried; on them I saw, November 29th., a large muster of Starlings—nearly thirty; and on Monday, December 1st., I observed the Blue Tit, in several instances, very near town, also feeding on the red berries of the mountain ash. I think it right to record these instances, simple as they are, that my paper on "Bird-retreating" may not be without a slight counterbalance. These are my first notices of these birds within five minutes walk of the busy workshops of our town. Nothing would be more gratifying than an opportunity of recording the appearance of many other birds, even though stray and occasional visitors.—G. R. TWINN, December 4th., 1856.

Reviews.

A Simple Catechism of the Animal, Vegetable, and Mineral Kingdoms. Particularly adapted to the capacities of very young children. By CHARLOTTE O'BRIEN. London: RELFE, Brothers. Duodecimo, pp. 70.

A CAPITAL little book. It is what it professes to be, and that is more than can be said of all books.

Prize Essay on the Prevention of the Smoke Nuisance. By CHARLES WYE WILLIAMS, Associate of the Institution of Civil Engineers. London: JOHN WEALE, 59, High Holborn. 1856. Imperial 8vo, pp. 48.

I SUPPOSE that a reviewer, like the editor of a newspaper, is believed to know everything;—a most mistaken belief, I will take upon me to assure all who entertain it. Among the multitude of subjects of which I know little or nothing, that on which the book before us treats must be included; but, nevertheless, I have no hesitation in saying that it appears to be the able, elaborate, and useful production of one who thoroughly understands what he writes about. This, indeed, is evidenced by the fact of its having had a special gold medal awarded to it by the Society for the Encouragement of Art, Manufacture, and Commerce. There is an excellent portrait (from a photograph) of the author given with it.

Hours of Sun and Shade, Reveries in Prose and Verse, with Translations from various European Languages. By PERCY VERNON GORDON DE MONTGOMERY. London: GROOMBRIDGE AND SONS. Edinburgh: Hogg. 1856.

HOWEVER heterodox I may seem to some, or perhaps many of my readers, for an assertion I have often made in private, I now say for the first time in public that, with a few—a very few—exceptions, Walter Scott's for instance, Percy's Reliques, and Gray's Elegy, I do not like poetry. I do not, however, trouble my readers with this expression of my private opinion except for the purpose of saying that the poetry in the little book I have now to notice forms one of the exceptions; and, as I am called upon to give an opinion about it, I can really say that it is an admirable little volume, both prose and poetry being exceedingly pleasing, and imbued most happily and judiciously with religious sentiments of the right kind. The reason why I like the poetical portion of it is not only because the sentiments are good and the rhythm easy, but because you can understand it as you read it straight through, a quality which, to my mind, must be an excellence, as contradistinguished from that which is so much of a contrary character as to require almost as

much study as the chorus of a Greek play to make out what it means. Take, for instance, Keble's "Christian Year," which has gone through some thirty or forty editions, for no imaginable reason that I can possibly think of but that the general idea was happy and the title well chosen; for though some of the poems are, I willingly admit, very beautiful, "Sun of my Soul," for instance, yet as to many or most of them, I defy any human being to read them straight through and tell you the meaning as he goes along.

I have sincere pleasure in heartily recommending this work to all families who read "The Naturalist." It is the very book for a present, of an inexpensive kind, to a friend.

The Natural History Review. No. VII. July, 1855. London: HIGHLEY. Edinburgh: JOHNSTONE AND HUNTER. Dublin: HODGES AND SMITH.

I HAVE received several numbers of this useful work together, and among them the one named above, which, as may be seen, I have already noticed in vol. vi. of "The Naturalist." It is my intention to review one of the quarterly parts each month, and thus a more continued and larger notoriety may be gained for the work. I have, I say, already passed under review the part before us, but as it has again been inadvertently forwarded with the others to me for the purpose, *in animum venit* to begin *de novo*, for the following reason. The said Part contains a review of my "HISTORY OF BRITISH BUTTERFLIES," and though I before thought that I would not remark upon one or two strictures which the editor had added to quite as much commendation as, in my opinion, the book deserves, yet as they really seem to me to be incorrect, and my having a "Review," as herein, of my own, gives me an opportunity, not often possessed by authors, of replying to what they do not agree with in any criticisms on their works, I enter the lists on the "Diamond-cut-diamond" principle.

And first let me premise that though having, as hereinbefore said, a strong antipathy to and profound contempt for the "Editorial 'We,'" (the most potent newspaper "Leading article," that frightens those who are childish enough to be "frightened out of their propriety" by such, being the simple effusion of the goose-quill of a paid John Wilcocks or Thomas Jones,) I desire my readers will not let this be understood as animadverting on the editor of the "Natural History Review," who is an able writer well up to the mark.

First, then, to be brief, I "take exception" to what the writer says as follows, in his strictures on my having admitted *Vanessa Hampstediensis* into my "British Butterflies," namely, that it "has no claim to be esteemed British, having been introduced into the lists by a mere accidental

error," and, in a note, "Mr. Dale's remarks, in a letter read before the Dublin University Zoological Association, explains how the mistake occurred in regard to this species." I assert, point-blank, that they *do not*, for the best of all possible reasons, that they *cannot*; nor can he or any one else ever do so, unless indeed some evidence never yet brought forward should be produced; and to prove this assertion, I here quote the observations I made on this subject in "The Naturalist," vol. iv., p. 139:—

"2ndly., as to the *Vanessa Hampstediensis*.—Let it be observed how guarded I was in what I said of it in my account.—"The only specimen of this insect that has ever yet been recorded, was captured at Hampstead, near London, by Albin, and then first described and figured by Petiver. It has since been continuously figured and described by succeeding Entomologists, who have faithfully copied the original picture. By some it has been considered a foreign specimen, accidentally imported; by others as the product of two different species. The specimen is however no longer in existence, and cannot speak for itself; no 'Eccc signum' can now testify to the truthfulness of the Entomologist who shall pretend more accurately to describe it, than in the stereotyped form which has come down to the present day.'

Mr. Dale said that I ought not to admit it at all, because it must have been a mistake of Petiver to say that Albin took it at Hampstead, and that he must have *meant* the 'Isle of Amsterdam.'

To this I replied, and reply,—

1st.—That Petiver's express words are, (I quote from my copy of Haworth,) '*Papilio oculatus Hampstediensis ex aureo fuscus*, (Albin's Hampstead Eye,) *where it was caught* by this curious person, and is the only one I have yet seen.'

2ndly.—That if he had meant the 'Isle of Amsterdam,' he would have said so.

3rdly.—That *Amstelodamum* being the Latin for Amsterdam, the word in this case would have been *Amstelodamensis*, and not *Hampstediensis*.

4thly.—That *Hampstediensis* means 'of Hampstead.'

5thly.—That the Isle of Amsterdam is described as a barren rock in the Indian Ocean, on which it was remarkable that not a single insect was to be found except the Common Fly!

He then said that there were three Isles of Amsterdam; but he could neither tell me in which of the three the Butterfly was taken, nor when, nor by whom.

6thly.—That every Entomologist of eminence, down to Stephens and Curtis, has given it as British.

'The very height and front' of my 'gravamina et reformanda' 'hath this offence no more.'

For every one who is open to conviction this, I fancy, will be conclusive.

Once more, the reviewer thinks that I should have said more as to the non-specific identity of *Pontia chariclea* and *P. sabellica* respectively, with *P. brassica* and *P. napi*, but here I differ altogether from him, the fact being that every shade of intermediate variety is to be met with; the prominent differences being only exhibited in the spring and autumnal broods of one and the self-same insect in each case.

Again, he says that I ought to have admitted *Chrysophanus chriseis*, *Hippothoe*, and *Virgaurea*, "the first and last of which can scarcely be denied," unless I consider them extinct. Hereon I remark that Mr. Doubleday has excluded every one of these species, and I believe Mr. Westwood also, in his second edition.

The writer, though he does not say so, seems to hint that I should not have admitted *Vanessa Huntera*, as I expressly call it an American species. It is, however, an undoubted fact that a specimen was captured on the wing in England, by Captain Blomer, and I therefore decidedly admit it, in precisely the same way that I, as all other writers, admit many birds as British on the ground of the occurrence of single specimens; for instance, the Spine-tailed Swallow, though an Australian species. It was the *dictum* of Dale, (though he will not, as I have shewn, act on it in the case of *Hampsteddiensis*,) and one of which I fully approve, that if a credible witness positively asserts a fact as of his own knowledge, the statement of such fact ought to be believed, unless positive proof to the contrary be shewn.

Here too he remarks on my saying of *Argynnis aphrodite*, that one was taken in a "wild state." The plain meaning was, that the specimen being taken, as I stated, in a midland county, and in a wood a few miles from a town, precluded the idea of its having been accidentally imported, which might have been more readily imagined if it had occurred in the vicinity of a sea-port town. The reviewer here seems, I think, to be rather hypercritical. I see no reason to alter the expression in any future edition.

Lastly, the worthy reviewer would rather that the book had not contained the many discursive paragraphs I here and there inserted. He would, it seems, have preferred dry details exclusively. Here too, however, I am "of the same opinion still," and not "convinced" either against or with my will. These are to my mind the very source of the popularity of the book, and of the many letters I have received from all parts of the country, expressive of the pleasure of the readers with it. Why should a reviewer's opinion be worth more than that of any other individual? and if I have fifty to his one, am I to agree with the one or the fifty? Not one of them can I afford to lose; and least of all can I coincide

with the reviewer in thinking that the few remarks of a religious tendency would have been better omitted.

Exchange.

Algæ.—The Rev. F. O. Morris has duplicates of the following species:—*Delesseria sanguinea*, *D. sinuosa*, *Dumontia filiformis*, *Odonthalia dentata*, *Himanthalia lorea*, *Polysiphonia parasitica*, *P. byssoides*, *P. urecolata*, *P. Brodiaei*, *Ptilota sericea*, *P. plumosa*, *Porphyra laciniata*, *Pycnophycus tuberculatus*, *Rhodomenia laciniata*, *Mesogloia virescens*, *Laurencia pinnatifida*, *Laminaria saccharina*, *Iridaea edulis*, *Halidris siliquosa*, *Gracilaria confervoides*, *Desmarestea aculeata*, *Ectocarpus littoralis*, *Declyota dichotoma*, *Cystoseira ericoides*, *C. fibrosa*, *Chylocladia ovalis*, *C. articulata*, *Chordaria flagelliformis*, *Cladostephus verticillatus*, *Callithamnion arbuseula*, *Bryopsis plumosa*, and *Alaria esculenta*.

Mr. T. Southwell, Hempton, Fakenham, Norfolk, has a few duplicate specimens of British Eggs, and will be happy to send a marked list to any subscriber who may also have eggs he wishes to exchange.—Nov. 1856.

Proceedings of Societies.

Thirsk Natural History Society.—The third annual meeting of this Society was held on the evening of the 5th. of December, 1856, the President, Mr. J. G. Baker, in the chair. The officers brought in their report for the past quarter, and were re-elected unanimously.

The Committee revised a list of the rules, and Mr. John Rhodes was requested to put in circulation amongst the members the result of their labours.

It was agreed that all donors of money, or books to the amount of five shillings, be recognised as patrons of the Society.

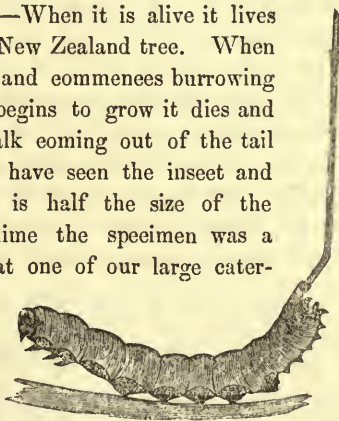
The following works were proposed to be purchased for the library, and accepted unanimously,—“Kirby and Spence’s Introduction to Entomology,” and “Dr. Lauder Lindsay’s Popular History of British Insects.”

Mr. J. H. Davies exhibited a specimen of *Cinclidolus riparius*, of Arnett, in fructification, from Sussex. Mr. J. G. Baker exhibited specimens from Gormire of an *Epilobium*, resembling *palustre* in habit of growth, but differing by its decurrent leaves and angular stem, which he suggested to be likely to prove an undescribed species, and which he proposed, if such proved to be the case, to call *Epilobium ligulatum*; he also shewed to the meeting a series of specimens of the critical Manchester *Barbaria*, described by Mr. Burton, under the name of *B. vulgaris*, variety *intermedia*.

The Querist.

In answer to your query concerning the bird named Chimney Swallow, (*Hirundo pelagica*), in the "List of Birds of Nova Scotia," which appeared in the December No. of "The Naturalist," the English name should, more properly, have been the American Chimney Swallow. There is also a bird which should have appeared in that list, namely, the Hudson's Bay Tit, (*Parus Hudsonicus*), common during winter. Some of your readers may be misled with regard to the bird in the list under the name of Northern Redpole, (*Linaria borealis*), which is incorrect, the bird being the American Lesser Redpole, (*Fringilla linaria*, Wilson,) or *Linaria minor*, (Swain and Rich.); it must not, however, be confounded with the Lesser Redpole of Britain, (*Linota linaria*, Yarrell.) There appears to be considerable doubt as to the number of species of Redpoles of Europe and North America, and as to which of those that have been described are identical. I am afraid that it may be some time before the "List of Water Birds" can be sent to you, on account of a copy having been mislaid, and the original being at present in North America.—T. BLAKISTON, Woolwich, December 17th., 1856.

Vegetable Caterpillar from New Zealand.—When it is alive it lives on the seed of the Rata Tree, a very large New Zealand tree. When it is a certain age it drops to the ground, and commences burrowing till it gets to the root. When the seed begins to grow it dies and turns to a part of the root itself:* the stalk coming out of the tail is where it attaches itself to the root. I have seen the insect and made the drawing from it. The sketch is half the size of the original. There is no doubt that some time the specimen was a live caterpillar, as it exactly resembles what one of our large caterpillars would appear if dried and wrinkled, though the tail has all the appearance of a piece of dried stick. Its colour is that of stone or bnff. Can any of your numerous readers favour me with a satisfactory explanation?—ARTHUR HAVERS, Tenterden, November 22nd., 1856.



CAN any of the readers of "The Naturalist" inform me what the substance is that is used to represent snow and ice in cases of stuffed birds, also the manner of applying it. At the Exhibition of 1851 there was a case of birds, from Sutherlandshire, representing winter, with icicles hanging down amidst the moss, and snow covering the rock-work above; perhaps some person may remember it, and also have some idea how it was managed;

* Not so.—F. O. MORRIS.

any information would oblige.—JOHN BRAIM, Sleights Bridge, Whithy, Yorkshire, November 17th., 1856.

THE HERATICAL SUBJECT.

I have received the following note from Mr. Frederick Bond:—

“I certainly do not agree with you that the Guernsey insects should be considered British, because a few Botanists and Conchologists consider the plants and shells so; and I am not a little astonished at your correspondent, W. S., taking upon himself to answer for all your readers agreeing with you; I know several that do not.—FRED. BOND, 24, Cavendish Road, St. John's Wood, November 6th., 1856.”

I wrote to Mr. Bond to inquire whether this note was intended for publication, and as in his reply he gives me the option of doing as I like with it, I have printed it as above.

It was needless to tell us that every one did not agree with W. S., as I had already published Mr. W. Gray's letter, and Mr. H. T. Stainton's dogmatical assertion, to the contrary effect. If however, as I incline to hope, the great majority of the readers of “The Naturalist” are persons who will “hear reason,” I refer through them any others who may take an interest in the question, to all I have said on the subject in the recent numbers.

Mr. Gray, I well know, is a sound lawyer and a good man; and Mr. Bond's name is also creditably known as a naturalist. The question, however, for my readers to decide with me, is this:—In the one scale we have the names of Babington! Hooker!! with Forbes!!! with every Conchologist and Botanist; and in the other those of Mr. H. T. Stainton, Mr. W. Gray, and Mr. F. Bond. It is in no disparagement of the latter that I ask the question, which scale is to kick the beam?—F. O. MORRIS.

It seems next to impossible to extend the wings of many, if not of most specimens of *Hymenoptera*, in a proper manner. Are any collections of this tribe of insects made with the wings in repose, as those of the *Coleoptera*,—namely, with only the legs extended, and the wings reclining backwards on each side, *ad libitum*?—F. O. MORRIS.

There are two or three observations by Mr. Morris appended to my note on *pupæ* found at the roots of ash, to which, according to his request I now reply. I entirely agree with him that many larvæ wander from their feeding-places till a satisfactory hybernaculum be found, *e. g.*, *Pygæra bucephala*, which, though a tree-feeding species, is rarely found at the roots of the tree on which it has fed. But Mr. Morris is mistaken in thinking that we must attribute to this circumstance the finding of *most* of the *pupæ* enumerated by me. This will be seen from my answer

to his question:—"What species have I fed in confinement on the ash?"—I have beaten from ash the following larvæ:—*P. populi*, *S. psi*, *A. ligustri*, the four *Tæniocampæ*, given, *E. illunaria*, *E. fuscantaria*, (once) *O. bidentaria*, *H. pennaria*, *P. pilosaria*, *B. hirtaria* and *betularia*, and *C. dilutaria*. According to M. Guènee *C. xerampelina* feeds on the seeds of ash; and I have little doubt that *E. innotaria* also feeds on that tree, as all my specimens of that rare species were taken, as pupæ, under moss on the ash. It is well known that *Sphinx ligustri* also feeds on the ash. When speaking of certain trees as harbouring certain pupæ, I by no means assert, (though I may infer,) that the larvæ feed on those trees. The question is how to obtain the moth; and if I can find the pupa at the root of some particular tree, it is comparatively immaterial whether the larva feeds on it or not.* With regard to *Alni* I must say that, in spite of its name, I am very sceptical as to its feeding upon alder at all. That tree abounds in this county, but I have in vain searched for the larva;† equally vain has been my search for the pupa, and there are few moths I have more sedulously sought for, since it is yet a desideratum in my collection. I have always understood that oak was its pabulum, but some of your readers may perhaps have met with it elsewhere. I wish to correct an error made in my first communication respecting the pupæ found at the roots of poplar. I included *C. diluta*; this is a mistake, I have found it at oak, but not at poplar.—J. GREENE, Playford, Ipswich.

In the Querist for December, Mr. Morris seems to doubt whether any of the larvæ of Lepidoptera feed upon ash. I have great pleasure in informing him that during some years collecting I have taken the following larvæ off ash, and all of them frequently, with the exception of *Orgyia pudibunda*, *Ennomos illunaria*, and *Eupithecia innotata*. *Sphinx ligustri*, *Orgyia pudibunda*, *Acronycta ligustri*, *Tæniocampa gothica*, *T. instabilis*, *T. stabilis*, *Odontopera bidentaria*, *Ennomos illunaria*, *Biston betularia*, *Cheimatobia brumaria*, and *Eupithecia innotata*. The larvæ of *Sphinx ligustri* and *Acronycta ligustri* are much fonder of ash than privet. The latter, though I have taken a considerable number, I never, except in a single instance, found upon anything but ash. This exception was a larva which I beat half-grown off hazel at Malvern; I fed it upon hazel and bred the perfect insect the following year. I am quite at a loss to understand how it ever got the name of *Ligustri*. I have not unfrequently found the pupæ of *Tæniocampa gothica*, *stabilis*, and *instabilis*, *Biston betularia*, *Agrotis putris*, and *Halias prasinana* at the roots of ash. As there

* Of course it is; but how can you calculate on finding it at the root of a tree it has not fed on?—F. O. MORRIS.

† Because it is a very rare moth.—F. O. MORRIS.

seems to be some little doubt with regard to the *Lepidopterous* larvæ feeding upon the alder, I take the present opportunity of stating that I have at different times beaten the following larvæ from that tree, and all of them not unfrequently, with the exception of *Pæcilocampa populi*, *Ennomos tiliaria*, and *Zerene rubiginaria*.—*Pæcilocampa populi*, *Platypteryx falcula*, *Notodonta camelina*, *N. dromedarius*, *Pygara bucephala*, *Apatela leporina*, *Tæniocampa gothica*, *T. stabilis*, *T. instabilis*, *Ennomos tiliaria*, *Chlorochroma æstivaria*, *Phigalia pilosaria*, *Biston betularia*, *Ypsipetes impluviaria*, *Zerene rubiginaria*, and *Cabera pusaria*. A few years since I had a pupa of *Acronycta alni*, the larva of which was found by my brother upon alder* in Radnorshire. I have also known the larvæ of *Geometra papilionaria* to be taken off alder. I have several times dug up the pupæ of *Tæniocampa gothica*, *instabilis*, and *stabilis*, and *Biston betularia*, at the roots of alder. I do not suppose that any one ever accused *Phragmatobia menthrasti*, and *lubricepeda*, *Segetia xanthographa*, *Agrotis putris*, *Chersotis plecta*, *Hadena persicariæ*, *Phlogophora meticulosa*, *Abrostola urticæ*, and *triphasia*, of feeding upon the leaves of the trees under which their pupæ are found, as it is well known that they all feed upon various low-growing plants, and I think that Mr. Morris entirely misunderstood Mr. Greene, if he supposes the latter to think that such is the case. The larvæ of these insects, like most others, when full fed, select a spot sheltered from damp and moisture, in which to undergo their transformations;† and as the nooks and crannies at the roots of trees are admirably adapted for this purpose, it thence happens that their pupæ are often found there. The larva of *Hadena persicariæ* is the only larva of those above named which can be suspected of feeding on trees, though I have never taken it upon anything higher than elder; it is however such an extremely polyphagous animal, that is just possible that it may sometimes aspire to more lofty food.—H. HARPUR CREWE, M.A., Stowmarket, Suffolk, December 8th., 1856.

✱✱ Having some years ago been taught to “chop logic” at Oxford College, I hope I am found to aim at precision in what I say, but it seems that I am not so fortunate in being understood as I could wish. The question I asked was, what species Mr. Greene had *himself fed in confinement* on the ash? and his reply is a re-enumeration of the species he has beat

* I am glad that this confirms my statement.—F. O. MORRIS.

† Is not this exactly what I had stated; I really cannot see that I am open to the charge of having misunderstood Mr. Greene, who without note or comment enumerated, in reply to my *quære* as to what species fed upon the ash, *lubricepeda* and *menthrasti* as among those he had found at the root of that tree. If this did not mean to leave it to be inferred that those species fed upon the ash, what did it mean? Is it I or Mr. Crewe that misunderstands Mr. Greene’s meaning? I will ask Mr. Greene himself to say; nay, he allows on the previous page, 41, that it is to be inferred.—F. O. MORRIS.

from that tree. So again, Mr. Crewe gives very valuable information as to several larvæ, but he tenders a similar reply to Mr. Greene's to my question, and does not mention *one single species* that he has *himself fed in confinement* on the ash.—F. O. MORRIS.

Obituary.

Death of Mr. David Dyson, the Naturalist.—We announce with deep regret the death of Mr. David Dyson, of Manchester, a well-known naturalist, at the early age of thirty-three, which took place on the afternoon of Wednesday, December 10th., 1856, at the residence of his brother, Mr. John Dyson, Woodbine Cottage, Rusholme. The cause of his death was ulceration of the larynx. Mr. Dyson was born at Oldham, in April, 1823, and his early years were passed as a factory worker; but he very soon evinced a passion for collecting insects, and spent every available penny of his hard earnings in the gratification of his love for entomology. He subsequently devoted himself to making collections in ornithology and conchology. His ardour in these pursuits led him, in 1843, to undertake a voyage to the United States of America. He was then twenty years of age, and quite unknown beyond his own neighbourhood, and unfriended, for his own savings and some money given him by his elder brother furnished him with such scanty means for his voyage, that on landing in New York he had only a few shillings left. His industry and energy, however, enabled him to make a tour in his new profession as collector through the States, across the Alleghany mountains, and as far as St. Louis, earning the means of subsistence on his way by selling portions of his collections in natural history to the local museums.

After an absence of less than twelve months he returned to England with upwards of eighteen thousand specimens of insects, birds, shells, and plants. This collection was found to contain some very rare specimens; his success was the source of amazement almost among the leading naturalists, and the late Mr. Hugh Strickland invited him to his father's residence, Cracombe House, Worcestershire, and attempted to engage him on behalf of himself and a number of other gentlemen to make a second voyage to America; but the negotiations failed. Being then near London he took the opportunity to visit that city for the first time in his life, and found, to his surprise, that his fame as a collector had preceded him thither. At the British Museum he found that the intelligence had reached there of his recent visit at Sir George Strickland's,* and an en-

* This is a mistake. Mr. Hugh Strickland's father, then resident at Cracombe House, the seat of Mr. Perrott, and now of Apperley Court, near Tewkesbury, Gloucestershire, was Mr. Henry Eustatius Strickland, brother of Sir George.—F. O. MORRIS.

gagement was offered him to go out in search of specimens to Central America, which he accepted. In corroboration of the statement that he thus early became acquainted with some of the leading naturalists, it may be mentioned that Mr. Edward Doubleday speaks of him in an article on lepidopterous insects in the second volume of the "Zoologist," published in 1844, as "an intelligent young man, originally a weaver at Oldham, whose zeal for entomology carried him out last year to the United States."

He started for Central America on the 17th. of September, 1844, and landed at Belize on the 3rd. of November. He remained in Honduras till the latter end of 1845, actively engaged in his vocation, and in the deadly swamps of that country contracted disorders which undermined his constitution, the immediate cause of his return being a sunstroke at Belize. He was eminently successful, however, and returned to England after forwarding an extensive and varied collection of insects, shells, birds, and reptiles. His collection included an extensive variety of orchidaceous plants. In this tour he also executed several commissions for the late Earl of Derby and others in live and dead specimens, which were added to the already magnificent aviary and museum at Knowsley. Some plants of his collection were also presented to the Manchester Botanical Gardens. The chief result of this enterprise, however, was the addition of many thousand specimens to the British Museum. In 1846 he went out to South America for the British Museum, and travelled in Venezuela, carrying with him very valuable introductions. He was accompanied by his brother, Mr. Amos Dyson, and they returned after an absence of about eleven months; his collection on this occasion including a great variety of humming-birds, moths, beetles, and shells.

In the latter part of his life conchology became his favourite study, and he has left behind him a private collection, numbering upwards of twenty thousand shells, many of them very rare, and including more than ten thousand different species. He has also left a large collection of birds and insects. These collections, it is said, are very valuable, and equalled by few out of London; and it is hoped that an effort will be made to secure them for some of the local public museums. Mr. Dyson succeeded Mr. Louis Fraser as curator at Knowsley, and he held that responsible situation up to the death of the late Earl of Derby, when the specimens of natural history collected there by that nobleman were sold. Some years ago he resided for a time with Mr. Cumming, of Gower Street, London, and assisted that gentleman in the arrangement of his extensive collection of shells. He was altogether a self-educated man, and, notwithstanding early disadvantages, his acquirements were considerable, his kind and gentlemanly bearing gathering about him a large circle of highly-cultivated men, whose esteem he retained to the last.—From the "*Morning Herald*."



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THE STUDY OF NATURAL HISTORY CONDUCTIVE TO HEALTH.

BY THOMAS FULLER, ESQ.

(Concluded from page 24.)



How to get rid of these Cats puzzles me sadly. Notwithstanding that they have found powerful advocates in some of your correspondents, in my estimation they are absolutely vermin. I have succeeded in getting rid of a litter of kittens; fortunately, they have gone into houses in the city, where their natural habits will be limited to the destruction of rats and mice; but I am sorry to say a continuance of certain nightly serenades of the most horrid sounds gives promise of another. If such consummation takes place, they, at least, shall have *early care*; meanwhile, something must be done to lessen the number of full-grown individuals now about. I did look for assistance from my gardener, but upon sounding him, found no hopes of co-operation from that quarter. Although a rough uneducated subject, I never met with a man so full of human kindness; he is taciturn to a degree, which makes him appear uncouth to some people; but I respect him so much for his honesty, and genuine goodness of heart, that I would not on any consideration, ask him to do what was opposed to his own feeling. Such is his gentleness that I have seen him take up toads tenderly with his spade, carry them a distance from the garden, and deposit them carefully in the nearest ditch. Such acts stand out in striking contrast to the cruelty generally practised towards these poor reptiles. I next made overtures to a man who works for me occasionally, and inquired if he could manage to make away with some Cats which infested my house. "Oh! yes," replied he, "I will manage that job;" so having appointed him to come in the evening for them, we proceeded to get possession of the offenders, with no small difficulty, so wild are they: we succeeded in capturing two, one of them, *La Chatte*, a principal performer in the serenades, as evidenced by appearance of the approaching consummation before mentioned. My accomplice was punctual to his engagement, and producing a sack, the animals were forthwith securely bestowed in it. "Now," said I, "the river, the river is the thing; tie a heavy stone round the neck of each, and cast them far as you possibly can towards the middle." "Lor Sir!" ejaculated the man, "I would not kill a Cat for the world." "Then what on earth did you come here for?" said I, somewhat nettled at the fellow's simplicity. "Oh!" added the man, "I am going to carry them a long distance off, to a mill that I know of, where they are sure of finding protection, and will never come back here to annoy you."

The working classes here share with sailors in the superstition respecting Cats, and believe that ill-luck is certain to attend any person who kills one. It is much to be regretted the same feeling does not prevail in regard to Magpies; or, what would be still better, the disposition towards each reversed.

It is not uncommon for Cats to return home after being taken long distances. Knowing this, I ought not to have placed any reliance upon the proposed plan; but feeling happy in the idea of being rid of them, I was not particular as to the way; so telling him to do what he pleased with them so as my garden was freed from their presence, I proceeded to join my family circle, congratulating myself upon being thus relieved from two of the worst of my tormentors, and claiming approval from the individual members of my family for having so cleverly managed this affair.

The night passed tranquilly, undisturbed by *Le tintamarre horrible*. In the morning all seemed right, and I had the satisfaction of walking round my gardens without seeing anything of my enemies; the morning passed without anything occurring to disturb pleasing reflections; the midday meal passed over, and taking my accustomed seat at the window commanding a view of the garden—Eh! what! surely it cannot be; yes, true enough, there crouched one of the Cats in a favourite situation, blinking in the sun with an easy indifference, as if nothing had happened! Though greatly mortified at his appearance, I comforted myself in the hopes that one at least was gone, and the worst, inasmuch as it was *La Chatte*, with *Les Chattée* in immediate prospect. Night passed *sans tintamarre affreux*, and the next morning, with no signs of the absentee. The day had nearly passed, and I was beginning to feel somewhat at ease, when in came a servant from the garden, with the disagreeable intelligence of the return of the other Cat. Rising from my seat, and going despondingly to the window, there sure enough was madame seated under a shrub, upon the watch for prey, intent as usual.

Pardon this rambling digression, and pray expunge it if you think fit to do so; but really these enemies to my peace so occupy my mind at present, that I could not help offering a few remarks upon them.

The Swallow tribes are now manifesting a disposition to leave us. On the morning of the 8th. instant, House Martins assembled in great numbers upon the roof of the villa adjoining this; there was a perfect charm in their twittering, and although all were speakers there appeared no difference of opinion, for suddenly they all dispersed, clearly of one mind, distributing themselves about the meadows around, with quick gyrations, collecting food as usual. Notwithstanding the researches of many indefatigable naturalists, we are still imperfectly informed upon the movements of these

interesting birds. They continue flying about here, but, as appears to me, in reduced numbers since their meeting on the 8th. Is it not probable that the flies constituting food most agreeable to them are now lessening? so that, like able economists, in which knowledge there is no teaching like instinct, they are enabled to comprehend the necessity of sending away a portion of their community. The unincumbered are perhaps gone, leaving those with young to follow, soon as sufficient strength is acquired, or as food fails. Such condition of affairs may reasonably be assumed to be the subject of discussion at the assembly mentioned, and the diminution in number points to that result.

Bath, September 19th., 1856.

SYMPATHY BETWEEN MAN AND ANIMALS.

BY O. S. ROUND, ESQ.

It is perhaps a trite observation how differently two persons will act under the same circumstances; one will fail, the other will succeed; arising, doubtless, from the possession of a particular faculty in one, which the other does not possess, and therefore has no inciting feeling towards; and this goes further, for it often happens that we do possess the faculty, but want example or stimulus of some kind to enable us to compass the act; and thus, to speak more to the point of what I am about to say, this master-spirit exercises a wonderful influence on the brute creation, and that not always directly.

I can speak from experience with regard to horses, the most beautiful, noble, and intelligent of animals, in my opinion; and I am sure I need only refer any practised horseman or whip to his own experience in confirmation on this point of what I would advance. Let him remember how he has thrown himself on the back of a favourite horse on a sunny morning, and taken a ride of a few miles, and how he has enjoyed the ride; and let him remember how cheerily and well his nag cantered along. Why was this? He may answer, "It was a fine morning, and I was well and in good spirits, and the fineness of the day influenced the horse too, if he felt such things;" be assured he did, but he did more than this, he was conscious of your own exhilaration, and partook of and sympathized in the feeling. Put another case, that of a hunt, when men and horses are excited enough, and yet even here, a timid and unassured rider will cause the most gallant horse to miss at his leap, not merely from bad management, but the *influence* which the rider has over his horse's *sympathies*. Thus we hear many anecdotes of an intractable, nay, unmanageable animal being subdued and gentle, merely by the consciousness of

being brought in contact with a master-spirit, although this belongs rather to moral influence than sympathy.

Dogs, again, are extraordinary creatures to discover the humour you happen to be in; I have observed their manners much, having always kept several; and I remember well on one occasion, a very intelligent Terrier, who was quite a parlour pet, displaying the appreciation of the feelings of those around her in a singular manner. My father arrived from London late in the evening, cold and wet, and not very comfortable; he came into the parlour and sat down by the fire, when Mrs. Nelly would usually spring upon his lap, but now she lay silent, and not offering her usual welcome, but eyeing him attentively; at length, being thawed and settled, he became more at ease, and madame ventured to get up and gently lick his hand, which was placed upon his knee, and this of course produced some such expression as "Why, my little Nell, are you there?" etc., and she took her accustomed place on his knee, and they were both shortly very comfortable. Dogs are thought to be the only animals that understand looks, but I should rather think that this proposition should be varied by saying, they are the only animals who *shew* that they understand looks; for I am persuaded that Cats are quite as intelligent, but not so malleable or docile.

All animals almost, and particularly wild beasts, are perfectly capable of recognising and appreciating determination in the eye, as we have witnessed notable instances of in Mr. Van Amburgh, and those who preceded and followed him; and even the Tiger in the jungle will not willingly face a man. It has been asserted that by looking intently at a Hare, in a form, you may pick her up; and I have assuredly caught them sitting; but this was when dogs were coursing about, and I pounced upon her suddenly. Indeed I once remember laying hold of a fine Rabbit in his seat, and turning him out of it with my hands, when he would not run, although in perfect health, and unhurt; and I could only account for this by the supposition that as we had many dogs with us, and formed a party of ourselves, he was completely paralyzed by fear.

ON THE CLASSIFICATION OF THE ANIMAL KINGDOM BY THE DISTRIBUTION OF THE NERVES.

BY F. M. BURTON, ESQ.

No. I.

THERE is, perhaps, no work that has so much conduced to the spread of sound scientific knowledge among all classes, as that of the "General

Structure of the Animal Kingdom," by Professor Rymer Jones. Treating of matter of the deepest import, it is written in language so plain and simple, that the most superficial reader can at once grasp its contents; and so interesting does each recital appear under the hands of this popular writer, that it is with feelings almost of reluctance that we finish the perusal of the book. In the course of the work, following out the systems of Cuvier, Owen, and Mc'Leay, the author has classified the entire animal kingdom by the distribution of the nerves, which, as he says, "must be regarded as the very essence or being of all creatures, with which their sensation, volition, and capability of action are inseparably connected;" and no one who has perused the book can deny the completeness of the arrangement; though, as will presently appear, it is impossible to carry out the favourite scheme of so many, that of the gradual and regular development of organic created matter, from one class of animals to another, by a series of connecting links, each order and genus being in every respect superior to the one immediately preceding; for in many places it will be found that though certain families are undoubtedly superior in one or more types of organization to those below them, yet in other respects they are not so highly developed.

Again, in refutation of the errors of such systematic naturalists, it will be seen on perusing the Professor's book, that a particular series of developments, which may perhaps run through several genera, is again repeated in a still higher tribe, as, for instance, the gradual concentration of the nerves, from *Annelidans* to the class *Insecta*, which is again reproduced, and, as it were, imitated in particular species of the single class *Crustacea*, and so on. How far however the gradual superiority of one class over another, in organic structure from the lowest to the highest orders, is exemplified by the work before us, I will endeavour cursorily to shew.

The first great division of the animal kingdom is called *Acrita*, or animals whose nerves cannot be discerned, including, *Sponges*, *Polyps*, *Polygastrica*, *Acalepha*, and *Sterelmintha*.

The first and lowest—the *Sponges*—are animals composed of horny elastic fibres of great delicacy, united with each other in every possible direction, so as to form innumerable canals, which traverse its substance in all directions. When alive, these simple animals are covered over in every part with a coating of gelatine, the common sponge being in fact only a skeleton of the original. They are invariably fixed, when alive, to some rock or marine substance, and have not the slightest power of motion, except when young. Their means of growth is by the continual suction of the surrounding water through the smaller orifices, which is again continually cast out from the large canals. They are reproduced by mechanical division, and the growth of little gelatinous gemmules, which on

their first appearance, possess the power of moving about by means of cilia, but these drop off on the animals becoming fixed to any suitable substance.

The next class, *Polyps*, is a very interesting one; the lowest in order, the Mushroom Corals, much resemble the Sponges, only, instead of a horny elastic substance, they secrete a stony calcareous skeleton. When alive, these corals are covered with gelatine, which is endowed with a slight power of sensibility, for it contracts if rudely assailed. These animals are not attached, and, as the motions of the sea would easily overturn them, in order to keep the right side uppermost, they are provided with a singular apparatus of air-vessels. Their means of growth is not well understood, (no organs of vitality being as yet discovered, but the gelatinous covering, it is presumed, in some way or other absorbs materials of support from the surrounding water; so that, if superior to the former genus in the nature of their secretion and sensitive powers, yet they would certainly seem to be inferior to them in their means of obtaining food by the formation of currents in the water. Their reproduction is by the development of sprouts or gemmules, which, in process of time, become detached.

The *Hydræ*, or Fresh-water Polyps, are next described. These animals are common in our ponds and ditches, and resemble little transparent lumps of gelatine; they have the power of motion, can appreciate the presence of light, and possess a simple bag in the nature of a stomach, with digestive powers of a very enviable description. Their mode of catching prey is by means of a variable number of tentacula spread round the mouth; and their means of reproduction is by the growth of gemmæ or sprouts, and by mechanical division or incision. Next come the cortical compound Polyps, gregarious animals, some of which secrete a soft central mass; a good example of which we have in our coasts in the *Alcyonium digitatum*, or "Dead man's fingers," as they are usually called, and others which produce a hard calcareous matter, as the *Corallidæ*, or Corals, etc. The Separate Polyps resemble somewhat the *Hydræ*, but have invariably eight tentacula. The stomach of these animals terminates in a tube, which extends into the common mass of gelatine, to which it probably conveys nourishment; there is in fact an individuality and community of nutrition in each Polyp. In their means of reproduction they are decidedly higher than anything we have yet met with, as each Polyp possesses an ovary, in which germs are developed.

The *Madreporidæ* and *Corallidæ* are next described—animals which, though exceedingly minute, and composed of a soft gelatinous substance, by the deposition of their skeletons, become a mighty agency in the hands of God for the production of new land in the tropical seas. In one tribe of

the latter genus—the *Tubiporidae*, we find animals which, although they live in society, do not seem to be organically united; they have, moreover, the power of protruding themselves from the mouths of their tubes, and their ovaries are more highly developed.

Next come the *Actinae*, composed of a fleshy substance, attached by one end to a rock, and having numerous tentacula at the other, with which they catch their prey. They can detach themselves from their fixed position at pleasure, and move along the rocks, or render themselves buoyant by distension. Their stomachs are simple bags within the body, and have only one orifice, the mouth. Their mode of respiration is by drawing water through the tentacula, which are perforated, into a series of chambers which communicate with one another, between the digestive bag and the outer integument of the animal. Their organs of reproduction are more highly developed than [those preceding; their eggs, which are very abundant, are secreted by peculiar membranes situate within the chambers before spoken of, and the young escape by a minute aperture at the base of the stomach. The *Anemones* are likewise produceable by mechanical division. As to their nervous system, some authors seem to think that they have discovered a few delicate threads in different parts of the body, but these surmises are not free from doubt.

The next tribe of Polyps mentioned are unciliated gregarious animals living in horny tubes, those having cilia—the *Bryozoa*—being of a much higher organization, as will presently appear. These Zoophytes are common on our own coasts, and are often taken by the ignorant for seaweeds. They possess a sort of circulation very much like that found in some plants. The tentacles of these animals, when stretched out, are seen to be studded with minute tubercules, but are never provided with cilia. Their stomach is a digestive sac filled with granular matter, and they are reproduced in different ways; by cuttings, as in plants, by the formation of new branches, and by gemmules capable of locomotion by means of cilia. The gemmules spring from cells produced at certain periods of the year on the stem of the Zoophyte, and are termed vesicles; they are larger than the common cells, and fall off when they have fulfilled their functions.

We now leave the Polyps and come to the next class, the *Polygastrica*, or Infusoria Animalcula, animals of the minutest kind, and the very atoms of creation, yet how wonderful in their structure! This family is divided into two groups, one having a soft body, and the other covered with a delicate transparent shell, the former termed *Nuda*, and the latter *Loricata* Animalcula. Some of the soft-bodied ones are perfect harlequins; they can contract and elongate themselves at pleasure, sometimes appearing round, at others linear, and they assume every intermediate variety of

shape according to circumstances. The shells of the loricated gentlemen of course confine their owners within due bounds, but their mailed coats are often beautifully varied in form. Their means of locomotion differ in different species; some move by filaments attached to the body; some are provided with styli, or stiff articulated bristles, which are moveable, and uneini, or little hooks, by which they attach themselves to foreign bodies; others are covered all over with cilia, which vibrate very rapidly; while some have the same organs only round the mouth. The oral orifices of the *Polygastrica* are usually simple, yet Ehrenberg in some species has described a sort of dental system. Their digestive apparatus consists of a number of internal saceuli, or little stomachs, and in most species there is only one orifice, the mouth, though some more organized pass their food right through the body. Their reproduction is either by external gemmules or buds, or by the same gemmules produced internally, which latter, when ready to come forth, escape by bursting open their common parent; they are also produced by spontaneous division of the body, each part becoming a separate animal. No circulation, or means of respiration, properly so called, has been seen in the *Polygastricæ*, neither has any nervous matter as yet been discovered.

Next in order comes the class *Acalephæ*, better known by the name of Jelly-fishes. These the author of the book above mentioned, following previous writers, classifies according to their organs of locomotion, and we have the *Pulmonigrada*, *Ciliograda*, *Physograda*, *Cirrigrada*, and *Diphyda*. The means of motion in the first order is by the alternate contraction and expansion of the large mushroom-shaped disc comprising the body of the animal, which resembles somewhat the motions of lungs in respiration; from the under surface of this disc hang various elongate processes, answering the purposes of tentacula. In the *Ciliograda* the organs of motion are bands of cilia placed in various parts round the body. The *Physograda* swim by means of bladders, which the animals inflate at their pleasure. The *Cirrigrada* move by means of numerous appendages called cirri, which perform the office of oars; these animals possess an internal porous skeleton; while the last, the *Diphyda*, are very extraordinary creatures, and derive their name from their appearing each one to consist of two separate portions joined together in the slightest way. The whole family possesses but a single cavity or stomach, appropriated to the purposes of digestion, circulation, and respiration, which functions are carried on by means of canals, which vary somewhat in different species. Many of them possess the power of stinging, but in what way it is produced seems still to be a mystery. Some have also the property of emitting phosphorescent light, which is exceedingly brilliant in some seas, "many of the larger ones being described by navigators as resembling white hot shot, visible at some depth beneath

the surface." The instruments of sensation in the *Acalephæ* are the tentacula and suckers appended to the body. No nervous system has been discovered with any accuracy, if at all, in even the largest *Medusæ*, and the organs of reproduction seem to be little better understood, though several authors have described the position of ovaria in various parts of the body.

We now come to the last family of acrite animals, the *Sterelmintha*, or *Parenchymatous Entozoa*, creatures which are nourished, as their name implies, in the interior of other animals. The simplest of this class are the *Cystiform Sterelmintha*, or *Hydatids*, one of which, the *Cœnurus cerebralis*, abundant in the brains of sheep, and met with in other ruminants, is shaped like a bladder, with numerous mouths furnished with hooks appended to it; others have only one mouth, as the *Cysticercus crassicolis*. The mode of reproduction of these curious creatures resembles that of some of the *Polygastrica* before mentioned, as the young are formed by gemmules growing in the inside of the stomach, which in course of time become detached, and burst through the body of their parent. Among the most interesting of this last tribe are the *Tenie*, or Tape-worms, several of which infest the human body, and attain to the prodigious length of twenty or thirty feet. The body of the commonest consists of a series of linear segments united together, and increasing in size towards the middle; and each of these segments may be regarded as a distinct animal, for every one of them is found to possess a complete generative apparatus, the ovaria occupying the centre of each joint. The head is of a very singular shape, and is provided with a mouth in the centre beset round with spines. The alimentary canal consists of two tubes, which extend through the whole length of the body, having cross canals in each segment, which unite them.

The next in order are much more highly organized animals; they are called *Distoma*, or Flukes, and are commonly found in the liver and biliary ducts of sheep. These little parasites excel all preceding ones in the development of their generative system, which is very voluminous; they are hermaphrodite animals, and their structure is very peculiar.

The *Planariæ*, which seem not altogether properly to belong to this class, are next described. They cannot be classed as *Entozoa*, as they inhabit ponds and stagnant waters, and in some respects they are decidedly inferior to the animals placed below them, which have been just described. They resemble gelatine in appearance, and can be multiplied by mechanical division. Their mouths are usually placed on the ventral aspect of the body. Their digestive apparatus resembles that of the *Distoma*, and the stomach has only one orifice, in this respect therefore being inferior to some *Polygastrica*. These animals are also hermaphrodite, like the last.

One more type of this class is mentioned in the Professor's book, the

most perfect of all the *Parenchymatous Entozoa*; they are called *Acanthocephala*. These animals, although they resemble the preceding genera of the family in their digestive apparatus, having no outlet except the mouth for discharging the residue of digestion, yet, in the organs of reproduction, they are infinitely superior, "and present a manifest analogy with higher classes, indicated by the complete separation of the sexes." They are *Entozoic* in their habits, and their mouths are armed with sharp recurved hooks, which enable them to hold securely to that part to which they are affixed.

Uppingham, January 7th., 1857.

INJURIOUS INSECTS.—No. VII.

APHIS, (*APHIDII*, L.,) OR PLANT-LICE.

BY J. MC'INTOSH, ESQ.

(Continued from page 181, Vol. 6.)

Aphides.—Each of these unwelcome visitants to our plants seems to live only to eat and be eaten; they take no trouble to conceal themselves, or even to shelter their bodies from the passing inclemency of the weather; sunshine or storm are alike to them; and while the emptied carcases of their neighbours are being piled around them in heaps by their enemies, they go on sucking the juices from the tender shoots and leaves, and as long as there remains a drop of sap on which they chance to be, they stick to their position until their time has come to be sucked by the larvæ of the beautiful *Heemerobius*, L., *Syrphidæ*, and the interesting *Coccinella*, of Linn.

The injuries occasioned to plants by these insects are greater than would at first sight appear from their small size and apparent weakness, but they make up in number what they want in strength, and thus become such formidable enemies to vegetation. Plants are differently affected by them; some wither and cease to grow, the leaves and plants put on a sickly appearance, and some die from exhaustion; others, although not killed, are greatly impeded in their growth, and the tender parts which have been attacked become stunted. Their punctures seem to poison some plants, and affect others in a most singular manner, producing warts or swellings, some of which are solid, and some hollow, containing thousands of the descendants of a single individual, whose puncture was the original cause of the tumour. The diseases caused to vegetation by these all-destroying pests, are worthy of being inquired into, and worthy of man's power to remedy; but unfortunately some of them are not to be remedied, at least

no practicable counteractors can be suggested. The application of strong tobacco-water mixed with soap-suds, has been frequently recommended, and is the safest and best remedy for the gardener. Oil of turpentine has also been recommended, by M. De Thosse, in "Mem. d'Agriculture," for their destruction in the following manner:—A few handfuls of earth were put into a bowl, on which a small quantity of the oil of turpentine was poured, which he rendered into a liquid state by the addition of water; with this mixture the points of the shoots infected was moistened, which had the effect not only of killing the insects but the eggs also; and the evaporation of the oil had for some time afterwards the effect of keeping off other insects from the shoots.

Oils do not readily mix with water, but the mode here adopted of mixing it with earth before the water was added, had the effect of dividing the essential particles into sufficiently minute parts, to cause a complete division of it through the whole mixture. Oil of turpentine should, however, be used with great caution upon the tender shoots of plants and trees, as it will not only kill the Aphides but the young shoots also. So also with a weak solution of arsenic, as we have frequently experienced from various experiments made with a view to discover a speedy remedy for the destruction of this pest.

To the agriculturist we can offer no remedy, but would here observe, as we have so frequently done in the pages of "The Naturalist," that he destroys his best friends in the very act of destroying these injurious insects, which in a certain measure are hidden from his eye; while the sparrow, lark, rook, crow, blackbird, thrush, chaffinch, greenfinch, bullfinch, hedge-sparrow, robin, tomtit, and many other useful feathered friends being in his eyes conspicuous offenders, are considered nuisances, and receive orders to depart this life—awful idea! it is quite suffocating! All this is done, and another year rolls round—How do things stand now? Why, your grain and fruit crops are in the jaws of a far more destructive enemy, which you cannot shoot or destroy otherwise; quite a blight to your expectations, after all the pains you had taken to extirpate these vermin *Birds!* However, a name once in vogue will have its day. Birds are not the only destroyers of the Aphides, for they have their insect enemies as well; a variety of species of different orders and genera, keep them within certain limits, one or two of which we will here describe. *Hylophila nemorum*, belonging to the Hemipterous order, who with its long beak taps the Aphis through the skin and drinks it empty. *Hemerobius*, L., the larvæ of which have justly been called the lions of the Aphides. They are furnished with a pair of long crooked mandibles, which terminate in a sharp point, and are perforated. When amongst the Aphides, like wolves in a sheepfold, they make dreadful havoc; half a minute suffices them to suck the largest,

and clothe themselves, like Hercules, with the spoils of their hapless victims. The next destroyer in our list comes the interesting *Syrphia*, whose larvæ are armed with a singular mandible, furnished, like a trident, with three points. Being blind he fixes himself by the tail, and gropes about on every side till he touches one, when he immediately transfixes it with his trident-shaped mandible, holding it up in the air as if not to be disturbed by its struggles for life, and when dead devours it. Notwithstanding the disadvantage of being blind, he makes his way from branch to branch with astonishing assiduity, examining by feeling about with the nicest discrimination even the remotest twigs. Having cleared a twig, monkey-like he swings himself to the next, and recommences his operations of rapacity.

“Not half sufficed, and greedy yet to kill.”

In this way thousands of Aphides are consumed by these larvæ, and so silly and helpless are their prey, that so far from thinking of escaping from their enemy, they may actually be seen walking over his back with the greatest indifference, and when seized resigning themselves to their doom almost without a struggle. In addition to these a small species of *Ichneumon* deposits its eggs in their bodies. These eggs soon assume the larva state, and consume the interior of the Aphis, till at length it sickens, and, like the stricken deer, retires from the herd to die alone. Such are the remarkably globose specimens of withered straw tint which are frequently found firmly adhering to leaves, etc., showing a minute hole through which, on attaining its winged form, the parasite made its escape.

Serviceable as the foregoing insects are, they must make room, and even yield to the interesting *Coccinella*, L., or Lady-bird, the favourite insect of our childhood, as the greatest enemy of the Aphides, for on these pests their larvæ entirely live, with the exception of *C. hieroglyphica*, which, according to Professor Reich, lives solely on the leaves of *Erica vulgaris*, (Common Heath.) These insects the hop-grower and the horticulturist will do well by protecting as much as they possibly can. They are generally seen in years when the Aphides are abundant.

Mr. Kirby states, “that in the year 1807, the shore at Brighton, and on the south coast, was literally covered with them, to the great surprise and even alarm of the inhabitants, who were ignorant that their little visitors were emigrants from the neighbouring hop grounds, where, in their larvæ state, each had slain his thousands and tens of thousands of Aphides.

From what we have already advanced, it will be apparent to those unacquainted with entomology, that the insects we have described above, in gratifying their own appetite, deliver us from a dreadful scourge, which is by many termed “Blight.” We often hear intelligent men say, “there is blight in the air to-day,” when this supposed “blight” is animal life,

(either visible or invisible to his naked eye, wafted by the winds or air, however unperceivable to the feelings of man) in quest of food—a wise arrangement of the Great Almighty, who provideth for all, from the microscopic insect to the biped who calls himself lord of the universe. If it were not for the numerous insect enemies with which the Aphides are surrounded, these prolific insects would multiply to such a degree, that they would finish by totally drying up the plants, which as it is they disfigure so much.

According to Swainson, our species of Aphides are not found in South America, but their place is supplied by numerous species of *Membrocis Centrobis*, Lat., which are in fact the plant-lice of that continent.

The Aphides are in general so similar in appearance and structure, that when we see one or two we may imagine to ourselves thousands as being in every way like them. They are oblong, conical, oval, soft and pulpy bodies; head furnished with a pair of long slender antennæ, which are reflected when in a state of repose, but in walking are directed forwards alternately to either side. It has six long and slender legs; the mouth consists of a thin tube, sometimes three-fourths of the length of its body, and when not employed is folded under the breast; with this instrument it pumps up the juices of the plants they infect. Wings, where they exist, are large and thin, crossed by a few strong ribs. Body peaked at the tip, and a little before it there are two short diverging tubes. In their habits they are sluggish. Their colours are varied, some black, some green, some yellowish, and some mottled, etc. Some covered by cottony filaments, and some quite transparent. But amidst this sameness, which tends to keep them united, there are several with strong individual characteristics, which form so remarkable a feature in the works of nature, and contribute so much to the pleasure we derive from their contemplation.

In our next we will attempt to describe some of the most injurious of these insects, and those who may require a more detailed account, I must refer to the papers of Mr. Walker, in the "Ann. Mag. N. Hist."

December, 1856.

(To be continued.)

ON UNITY OF SYSTEM.

(Continued from page 29.)

"Thro' ceaseless change to seek th' unchanging Pole."

THE colossal birds of other days, some of which were at least twice the size of the Ostrich, are well known. They built no nests for their eggs, had no care for their young, and were degraded in size and in number of kinds before the epoch of the nest-building, musical, and bright-hued birds.

The next especial degradation occurred with the age of Mammalia, or

the Tertiary and Post-tertiary epochs. The third and last age of vegetable life, that of Dicotylidoneous plants or our common trees and flowers, began just before the age of Mammalia. The Mollusca, Fishes, and Reptiles, with a very few kinds of edentate Mammalia, passed away with the Reptile age and with the cretaceous period, and new species of these tribes were created with the Mammalia. The revolution at the end of the cretaceous period was the most universal on record; and nearly all, or perhaps quite all the then existing species were exterminated.

The second great period of the animal kingdom, and the dawn of the present order of creation now commenced. The diversity of climates began with the age of Mammalia, but they were warmer than they now are during the first half of that age. The four great divisions of Mammalia each had their day in succession, and also their degradation previous to the creation of man; and to each was assigned a part of the world for its pre-eminence, and where it still continues to exist. Thus the Marsupials once flourished in New Holland, where there are Marsupials still, but of lesser size. The past and present fauna and flora of Australia and of New Zealand represent the furassic period of Europe in early time, the present era affording Trigonias, Terebratulæ, Cestraceous Fishes, and the Araucanian Coniferæ—all furassic types, besides Kangaroos and Moas.

In like manner, the Edentata have dwindled in South America, for in that country, which, in the last age before man, produced the giant Megatherium and Glyptodon, and other related Edentata, there are now the small Sloths, Armadillos, and Ant-eaters. The Herbivora, which inhabited it also, passed away with the Megatherium. North America was chiefly tenanted by the Herbivora; and among the large Mammalia which had possession of the renewed world after the life of the cretaceous period had been swept away, the largest, as far as has been ascertained, lived on that continent. The Palæotheria of the Paris basin were but half the size of those of the Nibruska. The Buffalo had now become the successor to the huge Mastodon, Elephant, and Bootherium; the small Beaver to the great Casteroides, and the existing Carnivora are all comparatively small.

The Carnivora, or most perfect class of all, especially possessed the Old World. The gigantic Lion, Tiger, Hyæna, Elephant, and other such quadrupeds, have now their very inferior representatives, and are also restrained within comparatively narrow limits, for they formerly (that is, in the Post-tertiary time,) were spread over the whole of Europe, and extended to the most northern part of Asia. The ancient species of Carnivora, in size and ferocity, far exceeded the largest of modern Lions and Tigers. Thus Australia, as regards its Mammalia, is a degraded country in comparison with South America; South America is degraded when compared to North America; and the latter is inferior when com-

pared to the Old World, its present Fauna being more analogous to the later Tertiary of Europe.

This inferiority of America did not occur till the more recent geological time, for in the Palæozoic Age, to the close of the Coal Period, it was as brilliant and profuse in its life as any other part of the world. In the above epoch, the globe was in an important sense not individualized in its climates, or its distribution of life, and only partially in its seas.

The whole of known American species of animals of the Permian, Triassic, Furassic, Cretaceous, and Tertiary Periods, is about two thousand, while in Britain and Europe, a territory even smaller, there are more than twenty thousand species. The Eastern world, that is, Europe, Asia, and Africa combined, has taken the lead in Animal life ever since Palæozoic times. In the Reptilian Age, Europe and Asia had species by thousands, while America was almost untenanted.

As between the hot equator and the frigid zone, tribes have now their limits in geographical distribution, so in geological times, between the warm Silurian Age and the cool present one, there was a localization of groups in time, a chronological distribution, an increase and period of maximum at different epochs along the ages. A few genera reach from the very dawn of life to the existing period; they are continuous lines, binding creation in one.

The Articulate tribe appeared first in their lower and aquatic forms—Crustacea and Worms, and did not attain their perfection until the close of the creation. They increased in number and variety of structure as the land was raised from the sea, and in proportion to the increase of diversity in climate, in soil, and in plants.

When the epoch of man approached, the land was enlarged, the mountains were raised, and consequently the valleys and the rivers were formed; the climates were more varied; each region had its peculiar vegetation and animals, and these became most numerous in kinds, and acquired their greatest variety and beauty. When man was placed on the earth, the day or epoch of rest ensued. The creation was then completed, and no new kind of creature afterwards came into existence.

The summary of the preceding notes may be comprised in the following words:—The most perfect and characteristic form of each inferior group did not, in order of time, immediately precede the period of each superior group, but passed away previous to that epoch, and there were more or less complete and long intervals of cessation of existence on the earth between the epochs. Each group of creatures in proportion as its species have a more developed organization, recedes further in affinity from all the other groups, whether superior or inferior to it; and, in process of time, is reduced wholly or partially to what it has in common with all other groups, or

is divested of all its peculiar characters, and is then taken up, as it were, into a higher degree of existence. This subject will be further explained in the sequel.

(To be continued.)

NOTES FROM NORFOLK.

BY G. R. TWINN, ESQ.

The Cuckoo.—The Cuckoo appears a gregarious bird, for one morning I was stirring early to enjoy a real sunrise in the country, when I was struck by the many cries of that bird, almost simultaneously. I am certain there were five, from the fact of my seeing so many take flight, when I disturbed them. They were all in an orchard of very humble dimensions. I remember in 1853, frequently hearing three crying at one time in Earham Park. In 1854, I received a specimen of this bird, shot by a gentleman, who said his grounds abounded with them, for they appeared to increase the more they were fired at.

Ferns.—In July I gathered on an old wall, in the town of Wymondham, the *Ruta-muraria*; on Thuxton Church, *A. trichomanes*, which grew alone, and on the south side most freely; and from Reymerstone Church the *A. trichomanes*; many roots of *Adiantum nigrum*, dwarfed, and the *Ruta-muraria*. Of this last Fern I never before saw such an abundance, nor so fine. On the churchyard wall of Mattishall the *Ruta-muraria* flourished. Doubtless in these retired, happy localities, no molestation had disturbed their growth, except a very rare visit from some naturalist.

The Marl-pit.—In the village of Marlingford is a large marl-pit, which has not been worked for some time; it is excavated from a hill-side abutting on fields, and is as large as any I have seen. One side of it contains many layers of chalk, and is nude of all vegetation, except on its very top; but it is pierced with hundreds of holes by Sand Martins, which flew screaming round me very thickly as I was probing to discover the depths of their nesting-places. I saw many shells lying about which the birds had ejected, and this is no small task for them, as in some instances the hole penetrated nearly two feet. Around the top of this pit I gathered clusters of the Deadly Nightshade, with its inviting flowers. The number of Spurge Laurels must have been near a hundred, of all sizes; some of them I could prove to be upwards of sixteen years growth. There they were in all their cool beauty, untouched by the villagers, who, no doubt, knew they were dangerous to trifle with: in one or two gardens I saw them growing transplanted. Here I enjoyed a feast of wild strawberries, that trailed about a very mat of leaves, enlivened by the red fruit. The Yellow Vetchling and the White Campion were also prizes.

December 4th., 1856.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 19.)

PROCYON.

- Procyon lotor*, *Desm. Geoff. Wieg.*
Richards. Schreb. Pennant.
Procyon brachyurus, *Wieg. Wagner.*
Schreb. Schinz.
Procyon Hernandezii, *Wag. Weigm.*
Schreb. Schinz.
Procyon obscurus, *Weigm. Wagner.*
Schreb. Schinz.
Procyon cancrivorus, *Desm. Fisch.*
Schinz. Ursus cancrivorus, *Cuv.*
Procyon Psora, *Gray. Weigm. Schinz.*

NASUA.

- Nasua socialis*, *Schinz. N. rufa*, *Desm.*
Viverra Nasua, *Linn. Schreb.*
Nasua solitaris, *Schinz. Viverra na-*
rica, *Linn. Schreb. V. Quasie*, *Linn.*
Nasua montana, *Schinz.*

CERCOLEPTES.

- Cercoleptes megalotos*, *Mart. Schinz.*
Cercoleptes brachyotos, *Schinz. C.*
caudivolvulus, *Illig. Shcom. Schinz.*
Potos caudivolvulus, *Desm. Potto*
Vosmar, *F. Cuv. Viverra caudi-*
volvula, *Pallas. Schreb. Lemur*
flavus, *Schreb.*

ARCTICTIS.

- Arctictis Binturong*, *Schinz. Viverra*
Binturong, *Raff. Ictides ater*, *Cuv.*
I. albifrons, *Cuv.*

AILURUS.

- Ailurus fulgens*, *F. Cuv. Schinz.*

MELES.

- Meles Taxus*, *Pall. F. Cuv. Schinz.*
M. vulgaris, *Desm. Ursus meles*,
Linn. Schreb.
Meles Labradorus, *Schinz. M. Labra-*
doricus, *Say. M. Labradoria*, *Sab.*
Ursus Labradoricus, *Linn. U. taxus*,
Schreb. Benn. Water.
Meles Anakuma, *Temm.*

MYDAUS.

- Mydaus meliceps*, *F. Cuv. Horsf.*
Schinz. Mephitis Javanensis, *Desm.*
Raff. Linn.
Mydaus collaris, *Gray, Schinz. Arc-*
tonyx collaris, *F. Cuv.*

MEPHITIS.

- Mephitis Mapurito*, *Lich. Fisch. Schinz.*
Viverra putorius, *Mutis. V. Ma-*
purito, *Gmel. Linn. Humb.*

(To be continued.)

A LIST OF SOME OF THE MORE
 UNCOMMON SPECIES OF LEPIDOPTERA OCCURRING IN
 THE NEIGHBOURHOOD OF WISBEACH, CAMBRIDGESHIRE.

BY MR. ROBERT MARRIS.

Colias hyale.—A single specimen, taken in a lane, Sept. 18th., 1843.

Colias edusa.—One I possess, captured by myself, August 14th., 1844.
 Not seen since.

Vanessa polychloros.—July: occasional.

Polyommatus alsus.—July. I have once taken it in the neighbourhood.
 Rare.

Acherontia atropos.—Rare: occasionally found in potatoe fields, in the
 larva state in autumn.

Sphinx convolvuli.—Very rare: two in the autumn of 1846.

Sphinx ligustri.—July and August: common some years.

Smerinthus ocellatus.—July; orchards.

Smerinthus tiliæ.—June: occasional.

Macroglossa stellatarum.—August: not uncommon in flower-gardens during the day-time.

Biston betularius.—July; orchards: rare.

Acronycta megacephala.—July; woody places.

Alcis robararia.—July; woody places.

Alcis rhomboidariæ.—July; among willows: occasional.

Hemerophila abruptaria.—May and June; hedges.

Cerura furcula.—July and August: rare.

Notodonta ziczac.—July and August; wooded districts: occasional.

Lophopterix camelina.—July and August; wooded districts: occasional.

Chisiocampa neustria.—Of frequent occurrence some years.

Gastropacha quercifolia.—June.

Cucullia umbratica.—Sheltered hedges.

Cucullia verbasci.—Sheltered hedges.

Mamestra persicariæ.—At intervals throughout the summer.

Triphena fimbria.—July: rare.

Harpalyce fulvata.—Frequenting hedge-rows.

Lynn Road, Wisbeach.

Miscellaneous Notices.

Beggar Woman's Dog.—"It happened on a time that a beggar woman's little dog, which she had lost, was presented to Lady More, and she had kept it some sen'night very carefully; but at last the beggar had noticed where her dog was, and presently she came to complain to Sir Thomas, as he was sitting in his hall, that his lady withheld her dog from her. Presently my lady was sent for, and the dog brought with her, which Sir Thomas taking in his hands, caused his wife, because she was the worthier person, to stand at the upper end of the hall, and the beggar at the lower end; which, when they did, the dog went presently to the beggar, forsaking my lady. When he saw this, he bade my lady be contented for it was none of hers, yet she repining at the sentence of the Lord Chancellor, agreed with the beggar, and gave her a peice of gold, which would well have bought three dogs; and so all parties were agreed, every one smiling to see Sir Thomas's manner of inquiring out the truth."

The Common Tern.—In your "History of British Birds," vol. vi, page 97, you state that a "young" one was caught in Monmouthshire on the

12th. of October, as I suppose you allude to a communication of mine, to the "Zoologist" vol. iv., page 1555, in which page the capture of a young one at Worcester is mentioned; there is a slight error, mine was not a young one, but a mature full-grown one. I have not heard of any about this neighbourhood since—a few years previously there had been a great many driven up the estuary of the Severn, and were seen as high up the river as Worcester; (I will try to ascertain where the fact is recorded, and if I find it in time for the next month's "Naturalist," I will forward the account,) we had some flocks about here at that time, at the "Fish Ponds," two long narrow reservoirs, about a mile long each, and from twenty to two hundred yards wide, situate in a mountain gorge, about fifteen or sixteen miles in a direct line from Bristol Channel, and at an elevation above high-water, of four hundred yards, which makes their visits the more unexpected.—JAMES BLADON.

The Kittiwake Gull.—In the same miscellany I have recorded the capture of a specimen of the above Gull near this town, which was so far exhausted as to be taken by hand.—Idem.

The Nightingale.—In your "History of British Birds," vol. iii, page 199, you state that none of the above birds are found in Wales; Broderip, in his "Zoological Recreations," page 64, (edition 1849,) also states, "the Welshman, it is said, never hears it in the Principality, though a poetical license has made it vocal there," but in a note corrects himself, it having been heard in the county of Glamorgan, and gives the letter in the appendix, page 383-4. I also find allusions in other authors to the same effect, which I do not quote as they all proceed upon the same hear-say evidence; my object in writing this note is to controvert that opinion upon several grounds. In the first place a question arises, is this county to be considered as forming part of Wales, or not? Although it is included in the circuit of the English judges, and so far may be considered a part of England, yet in its geographical and geological features it is evidently a part of Wales; and, in addition to its physical conformation, the language, manners, and customs of its inhabitants equally claim it as Wales. I can claim for miles around the neighbourhood the honour of being one of the most favoured haunts of the celebrated singer of the night; and as only one parish intervenes between here and the county of Glamorgan, (undoubtedly Wales upon any hypothesis,) I can hardly believe that it can be so extremely local, as to be so very abundant here, and none a few miles distant. There have been many instances of its being reared from the nest and caged, with success. I well remember some years ago walking from Newport to Pont-y-pool, on a summer's night; we started about ten o'clock, and came along the canal side, (which runs near the

base of the mountains,) the whole of our journey, about ten miles, was rendered most delightful by the singing of the Nightingales answering each other, as soon as one ceased its strain it was taken up by another on either side, so that during the whole progress of our walk it seemed one continued concert from end to end; in one particularly noted locality, about three miles distant from here, I should think there could not have been less than a dozen of them. Another reason for not believing in its absence from Wales, is its having a name in the common *spoken* language of the present day in Wales, Eos, (ëos, dissyllable;) was it unknown or extinct, the name would be forgotten or only known by reference to books on etymology, but here it is known in the vernacular regularly by every Welshman, and many of whom know it by no other name. It also forms part of the name of many localities in Wales, given at a time when names were meant as descriptive of the places; thus we have Court-yr-Eos, (the Nightingale Court;) Pentre-yr-Eos, (Nightingale Village;) Pant-yr-Eos, (the Nightingale's hollow;) and other significant allusions to its residence or visitations.—JAMES BLADON, Pont-y-Pool, November 25th., 1856.

Extraordinary Flights of Larks.—A correspondent sends us the following:—"I have just returned from a stroll in the Regent's Park (one o'clock p.m., Saturday), where I witnessed a very unusual spectacle. When about one hundred yards from the railing of the late Mr. Holford's ground, I was brought to a stand by observing an immense flight of Larks coming over the Zoological Gardens, and making for the late Marquis of Hertford's. Their numbers were countless, and they literally darkened the air; they were flying very low, and were obliged to divide in order to pass me on either side. This flight took two or three minutes to go over, and, after a brief interval, was succeeded by another almost as numerous. Being curious to observe whether it would be continued, I remained walking up and down, and was presently gratified by observing another approach from the same quarter, and passing over precisely the same line of ground. I stayed on the spot for upwards of an hour, during which time flight after flight passed over me, sometimes in detachments of a few hundreds, at others in myriads. In one instance one of these flights settled almost within pistol shot of me, and covered the ground, within a few inches of each other, for about the space of half an acre. The unusual sight attracted the notice of one of the park-keepers, and of several persons who were passing, and who all declared that they had never witnessed anything like it before; indeed it might well be an object of astonishment unto the wide, upturned, wondering eyes of cockneys, for although I have for the last twenty years been accustomed to be abroad in the severest seasons, and not an unmindful observer, I never saw such large and such continuous flights

of these birds. How long they may have been passing over before I came, I of course cannot say; I only know that when I left, after being detained upwards of an hour by the phenomenon, 'the cry was still they come.'—From the "Times" of February 2nd., 1857.

Does the above explain the local scarcity already spoken of?—F. O. MORRIS.

Rara Avis.—An addition to British collections of Zoology has recently been made in the shape of a fine specimen of the *Scolopax Sabini*, or Sabine's Snipe, which was shot by M. T. Smith, Esq., M. P., on the 17th. of October last, at Raynham, near Fakenham, Norfolk, and which is now in the possession of his son, a member of Trinity College, Cambridge. In addition to this the Little Auk, the capture of which at Shelford has been already mentioned in our journal, and which is now the property of the Rev. E. Perowne, of Corpus Christi College, and a beautiful White Thrush, shot by the Rev. J. J. Bumpstead, of King's College, were lately to be seen in the atelier of Mr. Baker, and now form ornaments to the cabinets of their possessors.—"Cambridge Chronicle," December 20th., 1856.

A Curious Incident in Entomology.—On one of those bright and balmy mornings, with which we are generally favoured more or less during our summer months, I was happily wending my way to the sylvan grove to watch the habits of its feathered songsters, and collect a portion of its fresh-born treasures, when my sight was arrested by a small dark spot in the distance, apparently making towards me at a slow and steady pace; and being somewhat curious [and inquisitive in my habits, I was determined, if possible, to know what the object could be. I therefore made a stand, and partly concealed myself in the hedge-row, in order to intercept its progress, or suffer it to pass by unmolested, as I might think proper at the moment. In a few seconds I discovered that it was a very large Bee, with something like a clog hanging on its leg. The slow and steady manner of its flying, added to its strange appearance, induced me to make a capture of it, which I found no difficulty in performing, being net in hand at the moment. I then found that the clog-like appearance was occasioned by a large wood-ant having firmly attached itself to the leg of the Bee. The circumstance was of course rather amusing to me at the time, but as I could not elicit any information from either of these captives, I was content to start them off again, to pursue their journey as long as they might find it agreeable to themselves. I could, however, but admire the courage of the ant, which appeared to have formed so strong an attachment, (at least with its mandibles,) that it did not relinquish its hold while I held them in custody. The Bee, however, went grumbling away, as though much annoyed by such unprovoked interference, and as by instinct, adopted a higher elevation, probably to secure himself

from such like interruption. A circumstance so trifling in itself might likely have passed by almost unheeded by me, had it not occurred to my mind that I have either heard or read of a very curious instinct* being possessed by the Bee tribe, namely, that of alighting on an ant-hill, in order to rid themselves of a parasitic insect, with which they are so greatly infested. Whether such had been the fact in this instance, or whether there had been any mutual arrangement for a journey, on account of such services rendered by the ant I will not offer my opinion; I can only assert that the Bee looked very clean and healthy, and carried his ant through the air with due care and steadiness. If on the other hand the ant intended any mischief to the Bee, it certainly had a very great object in view, and a very formidable task to accomplish.—C. WALFORD, Wikam, November, 1856.

Winter Work.—As this is the season for relaxing, re-setting, etc., etc. of insects, I beg leave to inform all who it may concern, that they will find chloroform by far the best of all “appliances and means to boot,” for cleaning specimens, especially *Coleoptera*; nay, I will not say for any one order more than others; for all. It is so very pure and volatile that it leaves no stain, and is vastly better than spirits of wine.—F. O. MORRIS.

WEATHER WISDOM.

“A RAINBOW in the morning is the shepherd’s warning;

A rainbow at night is the shepherd’s delight.”

“Evening red and morning grey,

Are sure signs of a fine day.”

“When the glow-worm lights her lamp,

The air is always damp.”

“If the cock goes crowing to bed,

He will certainly rise with a watery head.”

“When black snails cross your path,

The air much moisture hath.”

“When you see gossamer flying,

Be sure the air is drying.”

“When the moon shows like a silver shield,

Be not afraid to reap your field.”

English Snakes.—When on the subject of English Snakes, we take the opportunity of inserting a paragraph from a note received from a correspondent, in reference to the habit of the English Viper swallowing its young—a fact which has been doubted by naturalists, and respecting the acceptance of which some hesitation was felt by the writer of the present

* I believe that this instinct in the Bee is alluded to in Kirby and Spence; but as some years have elapsed since I read this work, I cannot speak positively upon it.

article, in his papers on Serpents, in the "Leisure Hour" for last year. The correspondent in question states as follows:—"A day or two since, a young man, on whose veracity I can perfectly rely, informed me that two or three weeks ago, he met with a female Viper and young, who immediately on their being alarmed, entered their mother's mouth, whence he drew them, to the number of six or eight, after he had killed the reptile. This occurred at Shidfield, in Fareham, Hants., and the young man informs me that he has heard from others in the same neighbourhood, that they have noticed the same remarkable fact, which may now be considered indisputable."—From the "Leisure Hour," forwarded for insertion by G. T. OLDFIELD, Esq.

Filling and Emptying an Aquarium.—Not having read in any works on Natural History anything like the plan I pursue, of filling and emptying an Aquarium, and thinking it may be useful to some of your readers, I propose giving you a short description of it. I employ a small gutta percha tube, of one-fourth inch bore, more than twice the height of the Aquarium in length, as a siphon, and having placed the vessel containing clean water on a higher level, one end of the tube is inserted and filled with water, by suction or otherwise, at the other end, out of which it will run, at a speed proportioned to the depth it is held below the end in the clean water; thus the Aquarium may be filled as gradually as can be desired. For emptying, the siphon is still more useful, as the gravel may be stirred up by the short leg, so as to raise the sediment, which will pass up the tube. By this means much trouble may be saved over the ordinary plan. For aerating the water, attach a pair of common blow bellows to one end of the tube, which should either be expanded to fit the nozzle, or else attached by a short piece of vulcanized India-rubber tube. The other end of the tube may advantageously be fitted with a glass nozzle, having an aperture of one-eighth or one-twelfth of an inch; this may be directed to any hole or corner, and the whole aerated conveniently in a short time. For emptying rock pools the siphon will be found of great advantage, as the water may be withdrawn to almost the last drop, without rippling the water or disturbing the inhabitants, and by hanging a muslin net on the long end, every living thing contained in the water may be caught. The tube for this purpose should be of two or three inches bore, and for convenience in carrying may be in short lengths united by vulcanized India-rubber. This capacity of tube cannot be filled by suction from the mouth, but one end should be stopped, and water poured down the other until full, and then plunged into the pool. Thirty feet is the minimum length for such a siphon, but the longer the better. During the past summer I tried to empty a pool on Lihon Island, with

one of three-eighths inch bore, which I found too slow, but got one baled out with a bucket, at the bottom of which was a cavity; in this I found a stone with a specimen of *Sagartia auroræ*.—ISABEL E. WILKINSON, December 9th., 1856.

Review.

The Natural History Review. No. VIII. Published quarterly, price 2s. 6d. London: HIGLEY, Fleet Street. Edinburgh: JOHNSTONE AND HUNTER. Dublin: HODGES AND SMITH.

I DON'T see very well how one is to write a Review of a Review, so I shall not attempt it in the present instance. Let it suffice, then, to say, that the "Natural History Review" is really a very valuable publication, as suggestively indicated by the following table of contents in the present part. Review 1.—"The Butterflies of Great Britain." By J. O. Westwood, 2.—"Popular British Conchology." By George Brettingham Sowerby, F.L.S. 3.—"Young Naturalist's Library, 'Beautiful Butterflies, British Species.'" By H. G. Adams. 4.—"Reading Lessons." By Edward Hughes. 5.—"A Manual of Marine Zoology for the British Isles." By Henry Philip Gosse, F.L.S. 6.—"Catalogue of the Bees of Great Britain." By Frederick Smith, M.E.S. 7.—"Mollusca Testacea Marium Britannicorum." By William Clark.

OBITUARY.

Death of George Johnston, M.D.

COMMUNICATIONS MADE TO VARIOUS SOCIETIES.

I.—"On the Advantage to Botany of Local Lists and Notes with reference to the Algæ of the East coast of Ireland". By Gilbert Saunders.

II.—"List of Marine Algæ collected at Skerries, near the Northern limit of the proposed Dublin district in the summer of 1854." By Gilbert Saunders.

III.—"On the effects of the Severe Frost on plants in the neighbourhood of Sligo." By The Right Hon. John Wynne.

NOTICES OF SERIALS.

I.—"The Annals and Magazine of Natural History" for July, August, and September, 1855.

II.—"Quarterly Journal of Microscopical Science" for April, 1855.

III.—"The Zoologist" for July, August, and September, 1855.

IV.—"Hooker's Journal of Botany and Kew Garden Miscellany" for July, August, and September, 1855.

V.—"The Naturalist" for April, May, June, July, August, and September, 1855.



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* * Correspondents are particularly requested to write the
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SWALLOWS.

BY O. S. ROUND, ESQ.



THOSE interesting birds, the Swallow tribe, (*Hirundines*,) have at all times claimed the peculiar attention of naturalists. Among the rest the Rev. Gilbert White, whose "Natural History of Selborne" is so well known, gave up almost all his leisure time, for a considerable period of his life, to the contemplation of their habits and probable retreat. It is very surprising to observe how a favourite idea once gaining a hold upon the imagination, is retained under the most adverse circumstances. Mr. White had a theory of his own that Swallows, or at least a great part of them, never left England at all; but hiding, like bats and dormice, or even retiring under water, spent thus, in a dreamy sort of condition, the uncomfortable months of winter. Now, if he had harped upon this subject with regard to the weak summer birds of passage, he might have had some show of reason on his side, but to fix upon the Swallow tribe, whose wonderful power of wing is so well-known and acknowledged, seems nothing less than infatuation. He was indeed to a certain degree sceptical with regard to the Willow Wrens and Whitethroats, but these seemed merely to engage his attention *en passant*.

No man has actually seen Swallows depart from our coasts, because their migration is probably taken in the deep of the evening to the coast, and at the dawn of day, or before it, they are traversing the ocean; but that they do so migrate there can now be little or no doubt. Read Caillee's travels to the interior of Africa, and see what he says, that during one winter he saw flights of the very same species of Swallow which we have in England. Look at the numerous instances of Swallows settling on the rigging of ships at sea, at the almost actual transits of flights of Swallows, which have been seen both in autumn and spring. Why, I remember perfectly well, when a boy, seeing a flight of perhaps fifty Swallows pass over our house very early in April, for we were expecting daily to hear the Cuckoo, and this must have been in the second week in April at the latest; they were flying very high and in a north-easterly direction, as well as I remember.

The Swallow, (*Hirundo rustica*,) properly so called, is that kind which is characterized by having the two outside feathers of the tail much longer than the rest; these are the same in the cock and hen, only the cock's are, I think, somewhat the longest: the Swallow-tailed Butterfly is so called from an analogous formation of its lower wings. The most unob-servant must be familiar with this bird, which only stays with us as long as the warm weather lasts, arriving in the third week in April, and departing about Michaelmas. His shape is very elegant, and his plumage,

although really only black, white, and brown, is so covered with blue reflections, that it appears quite dark blue on the upper parts, and the brown chin may be almost called dull red. The wings are so long and tapering, his motions on the wing are so easy and graceful, and he is formed after such a delicate manner, that he may be regarded as the handsomest of his tribe, taking all things into consideration. He very seldom alights, but when he does it is usually on a chimney, whence he has been called the Chimney Swallow; he also often builds in chimneys, but not exactly in the flue where a fire is kept; indeed, in the summer time, this would be difficult, unless he chose that proceeding from the kitchen. Some skill is requisite in ascending and descending the shaft, and it not unfrequently happens that the young birds, if they are not perfect masters of their wings before they leave the nest, fall down into the room below.

The nest of this little bird is formed of mud, mingled with short straws or bits of grass to give it consistence; it is shallow and open at the top; in this are usually found five eggs, which are long and white, elegantly speckled with red. The same nest is usually renovated, and accommodates a second brood, which may be seen essaying on, as yet, imperfect wing, when the bulk of the tribe has departed for other shores. It not unfrequently happens that Swallows build in barns; from this circumstance, in Sweden, they are called Barn Swallows. The most unlikely places have been used by them for the purposes of nidification, such as the back of a dried Owl hung up in an old garden house, a shell, the handles of a pair of garden shears, and the like; they will also build under a verandah, but here they are seldom allowed to remain, as the litter they make underneath is by no means compatible with the neatness of a mansion's approach.

These pretty little creatures are perpetually on the wing, and the number of miles which they must traverse during a long summer's day must be immense. It is the habit of this species to fly very low along paths in meadows, and by this peculiarity they may most readily be distinguished. Their song is very inward, but when sitting preening their feathers in the sun, and twitting from some chimney or other elevated point, it is very harmonious; he is indeed the only one of the genus which has any song, properly so called; his call is short, and has a soft sound; but when a bird or animal of prey appears it increases to a scream of the most expressive warning.

The next most familiar of the tribe is the Martin, or Window Swallow, (*Hirundo urbica*.) Now this, when viewed in the hand, is a delicately beautiful little bird; his plumage consists of a mouse-colour, black, and white merely, but then this is so prettily arranged in contrast. His head, back, wings, and tail are black, subsiding to a soft brown at the nape,

whilst the feathers above the tail are snowy white, as are all the under parts—neck, chin, and all, and his beautiful little feet covered with small soft white feathers. The individuals of this species are so alike, that you can only distinguish the cock and hen birds by the superior darkness of the cock's plumage. These birds also use mud in the construction of their dwellings, which, like sensible architects, they take their time in constructing, so that the clay has time to dry before another layer is applied, and thus the whole fabric attains a firmness which could not otherwise be compassed. This is generally built against an upright wall, under the eaves of some roof or the sill of a window, and can by no means be considered a dis-sight. Luckily for the poor little builder, there is a superstition prevails, that as soon as Martins desert a house where they have been for years in the habit of building, bad fortune is certain to attend it; however this may be, it is certain that they are seldom or never disturbed, and people even go so far as to put a slanting board underneath, to shoot off what may accidentally fall from them. They are, however, seldom annoying from this cause, as the old birds invariably carry to a distance what might be offensive if it dropped on the ground beneath.

The eggs of the Martin are usually five in number, and quite white. The young birds are often fed by the parents on the wing, but it is performed so adroitly, that it is not easily seen; with the Swallow it is notorious enough. Although this bird is by no means so graceful as the Swallow, it has its own peculiar beauties—a certain prettiness which is chiefly produced by the delicate contrast of the markings, and the butterfly kind of motion he has on the wing. He is very much smaller than the Swallow, and has a particular mode of flight, for instead of sailing gracefully on the air, and darting through it with the rapidity of an arrow, he flutters and skims alternately, fluttering as he rises, and skimming as he descends. I should say he was also more numerous than the Swallow, and more domesticated, at least he is more easily viewed, from not possessing such wonderful power of wing as the other, and always builds at our very thresholds, which he is perpetually flitting around with a harsh kind of chirp; for song he has none. The food of both these kinds is insects, which they catch on the wing; the act of catching is necessarily very quick, and hardly to be observed; but you may often hear the snap of the bill as they pass you.

(To be continued.)

ON UNITY OF SYSTEM.

(Continued from page 60.)

THE system or classification of animals is wholly in unison with their chronological distribution, or with their creation in successive geological epochs, and accordingly affords innumerable illustrations of the law of degradation, which is manifest in all the successive subdivisions of the animal kingdom. It is apparent in every species by the comparison of the early state with the final state, and of one part of the structure with another part. All kinds of living creatures are alike in their first origin, and in the progress of growth the characters which are common to the whole animal kingdom first appear, and then the distinctive character of the class, the order, the family, the genus, and the species are successively evolved, until all the characters have their most full development, and the creature has attained its most perfect state. The relation of classes and of successive lesser groups with each other is most apparent in the more simple forms of each group; and the more the character of a species, of a genus, or of a class is developed, the less is its affinity with any other species, genera, or classes. So the Radiata, Mollusea, Articulata, and Vertebrata are most allied to each other in their lower forms and in their earlier growth, and, as it were, in proportion as they are degraded or more or less deprived of their peculiar characters. So also a species is degraded in proportion as it wants its distinction from other species; the degradation of a genus is caused by the total or partial cessation of its most characteristic species; the family has the same relation to the genus, and the order to the family.

The primary divisions of animals and the divisions and subdivisions of each of them are not linked together by the highest form of the inferior division being connected with the superior division, but quite otherwise; that is, they are united by the lowest forms, and more especially by the earlier state of the lower forms, when comparatively all the characters are in common. Thus, in proportion as a creature is more highly organized, or develops more of the characteristics of its class, it becomes more remote from the classes that are higher, as well as those that are lower than its own.

The system or classification of animals is therefore in accordance with their chronological succession and geographical distribution, and equally subject to the law of degradation, which also governs their growth and their comparative structure.

It is well known that the higher classes in their progressive growth pass through states or transition forms which resemble or are akin to the permanent or final states of the inferior classes. But, by way of compensation,

this final state of the inferior creature is far more perfect and complete in its functions than the transition state of the superior creature, so that the latter while progressive, may be said to be a degradation of the former when fully developed, being but a means or passage to a higher state, which the inferior creature cannot only never attain to, but from which it recedes more and more as it advances towards its final state or perfection. The earlier and generally hidden state of the superior creature may thus be studied in the ultimate state of the inferior creature, the former corresponding to the latter, though in an imperfect and undeveloped form.

The independent existence, and more or less distinct and peculiar form of the earlier creature, is a character of the Amphibia amongst the Vertebrata, and of the Articulata generally; and these in their early stage represent the perfect state of other classes which are inferior to them. It is also an invariable rule that the transition state of the Articulata or higher class is degraded or imperfect in comparison to the permanent state of the lower class. Thus it appears that the weakness and imperfection of the early state of a creature is necessary for its advancement to a higher state, in conformity with the law of degradation; its early state being inferior to the final state of an inferior creature, and its final state superior to the early state of a superior creature.

The law being thus manifest in the comparison of one kind of creature with another kind, it remains to be shewn how it appears in the comparative organization of every creature, that is, in the comparison of one part of its structure with another part. In the process of growth the decrease or degradation of one part is simultaneous with the growth of another; the substance which was assimilated to and enlarged one part of the structure being partly transferred to another of superior faculties; and when this process is very conspicuous, as in most of the Articulata, the creature is said to undergo a metamorphose. The lower members by being degraded are thus partly taken up or assimilated to higher members. During the above process there is a period of weakness, or infirmity, or helplessness, which all creatures more or less undergo previous to their increase in size and strength, or before they pass to a higher degree of organization or of existence. It may be clearly seen how this transitory incapacity or suspension of the faculties corresponds to the times of cessation of existence between the epochs before mentioned.

Parts of the animal structure which are primary, and have their full development, and occupy nearly the whole of the organization of the lower classes, are successively more and more degraded in the higher classes, and become more and more partial, superficial, and unimportant. In a worm every segment of the body seems to be equally developed. In one of the Myriapoda, the head has its peculiar organs, but all the other

segments are furnished with legs, and are equally organized. In a larva the abdominal segments are obviously inferior in importance to the thoracic segments; but, nevertheless, the abdomen is apparently almost on an equality with the thorax, and its segments are furnished with legs. But when the change into the perfect insect takes place, the abdomen is degraded, that is, it is deprived of its appendages and diminished in size, and its substance is partly transferred from it to the head and to the thorax, and serves to develop them and their appendages.

It is sufficient in this place to shew the agreement of the geographical distribution of animals with their chronological succession, by citing the following law:—"Every species has come into existence coincident both in space and time with a pre-existing closely-allied species." Vegetation, as is manifest by Morphology, is also subject to this law; for the fullest development or luxuriance of leaves, of flowers, and of seed, cannot co-exist or appear in succession on the same plant, but the foliage must be diminished, or degraded in proportion to the development of the flowers, which in their turn must give way to the perfection of the seed.

Thus geology, classification, structure, growth, comparative anatomy, vegetation—in short, all the branches of Natural History, offer an innumerable variety of illustrations of the law of degradation, for every one of the millions of kinds of creatures that inhabit the earth has a peculiar modification of the above law.

(To be continued.)

THREE DAYS IN THE FALKLAND ISLANDS.

BY J. S. WALKER, ESQ.

(Continued from page 219, VOL. 6.)

DURING our ride across the camp, we saw several herds of wild horses; they appeared in good condition, but were sorry beasts, not worth the trouble of breaking-in. They are caught with the lasso, and thrown down, and our guide assured us that half an hour after they were subjected to this treatment, they would allow themselves to be led away by a halter. It was amusing to watch the anxiety with which the father of the family collected the mares and foals together, and drove them away before us. Those we were riding were imported from Rio Negro, and were of a stout short-legged description, without any good points, but sure footed and serviceable. A few of the Island-bred horses were at work about the settlement, but they were said to be both sluggish and vicious, and incapable of enduring fatigue. But the wealth of the Falkland Islands consists in the wild cattle, of which it is said there are between thirty and forty

thousand. Those we saw were small and of a coarse breed, but we were told that the cattle on the southern part of the island are much superior. They do not get so fat as in Australia, seldom exceeding five hundred pounds in weight; but the meat is of a tolerable quality, and the price on the settlement is only two-pence per pound. Judging from the sleek condition of the wild horses, I am inclined to think that if greater trouble were taken, or rather, if any trouble at all were taken, in improving the breed, they would become larger and fatter.

The whole of the islands abound with rabbits, and in many parts the ground is quite honey-combed with their burrows, which adds much to the danger of riding. We shot a great many, which our guide fastened to his horse by loose straps of untanned leather provided for the purpose. He presented an odd appearance as he galloped about with the rabbits and other game dangling about him.

Of course these little conies, like the horses and cattle, were originally imported, the only indigenous quadruped is the wild dog, (*Canis Magellanicus*.) somewhat larger than the English Fox. We did not meet with a single specimen, indeed it is so scarce that only one had been seen at Stanley harbour during the last three or four years, which seems rather strange, as there is no want of food for them in the camp.

On one of the adjacent islands there is a breed of wild dogs, but I am not aware whether the Falklanders procure any.

We were surprised to find that we could not procure any fish; occasionally large shoals of mullet enter the bay, and are taken with the seine, but no fish are caught in the salt water with the hook and line. In the rivulets which flow through the peat bog, there are plenty of small trout.

A fine large species of Snipe is very plentiful, and we shot great numbers; they were of an excellent flavour, and were greatly relished by the invalids on board the Great Britain. There are three species of Wild Geese, the Upland, Brent, and Kelp Goose; the two former are excellent eating, but the flesh of the Kelp Goose is rancid, and of a fishy flavour, and quite unfit for the table. Flocks of them were feeding on the plains, or swimming amongst the sea-weed, in company with the Loggerhead Ducks. They had young ones at the time, and kept up an incessant gabbling until we had passed. Besides these we saw two species of passerine birds, and a very handsome Starling with a red breast, (*Sturnus militaris*.)

Many of the birds were very tame, having probably never seen a human being before. A Thrush particularly evinced great curiosity, and undeterred by the report of the gun, followed me for a long distance. However, when I attempted to come to closer quarters, he scuttled away and hid himself amongst the low bushes, but invariably returned when I moved on; suggesting to my mind the fulfilment of the promise made to Noah after the

Deluge, when the Deity committed to him and his descendants for ever, the earthly sovereignty of the universe:—"And the fear of you and the dread of you shall be on every beast of the earth, and upon every fowl of the air, upon all that moveth upon the earth; into your hands are they delivered."

Walls of peat, with a ditch on one side, are built across various peninsulas; the tame cattle and horses are thus confined. Water is procurable in all situations, by digging a few feet into the porous soil.

Large numbers of the eggs of Penguins and Albatross, (*Diomedea*,) are brought into the settlement during the breeding season, from the "rookeries" on the rocks and islands round the coast.

There were formerly a great many Fur Seals, but these animals are now nearly exterminated. A good deal of oil of an excellent quality is procured from the Hair Seals, which are still tolerably numerous; but as these are generally killed when they have "pups" by their side, it is expected that they also will soon become scarce.

After we had supped at Port Louis, I tried in vain to induce my companions to accompany me on a stroll, so I took my gun and walked out alone along the shores of the bay. At a few hundred paces distant I came upon the ruins of the old fort, around which were the vestiges of three or four houses. This place, like more flourishing settlements, had a history of its own—of battle, and murder, and sudden death. It was here that the Americans had performed the valorous exploit of destroying this wretched township, and the *débris* of the houses almost levelled to the ground attested their prowess. Here too, more than twenty years ago, the Guachos and Indians having mutinied against the English commandant, had cruelly massacred him and his companions, and had dragged their dead bodies with their lassos into the interior. The scene looked so dreary that it required little stretch of the imagination to picture to one's self the wild Guachos galloping across the plain, with their ghastly burdens trailing at the horses' heels. But now a flock of beautiful Kelp Geese were quietly feeding upon the glais of the battery, and a colony of rabbits had taken up their quarters amongst the ruins.

Having crossed a point of land, I came upon the shores of Berkeley Sound; the whole bay seemed alive with Wildfowl and Gulls, and I found several young Snipes, only a few days old. I also saw some Upland Geese, but they were so wary that I could not get a shot, whereas I might have "bagged" any number of Kelp Geese and Logger Ducks, but they were not worth the trouble of carrying home.

I cannot explain the sense of desolation I experienced, as I wandered over this miserable country. I could almost fancy that it lay under the spell of some potent magician, who had doomed it to utter sterility.

"For over all there hung a cloud of fear,
A sense of mystery the spirit daunted,
And said as plain as whisper in the ear,
The place is haunted."

The next day we rode back to Stanley harbour, and the following morning we hove up our anchor and steamed slowly out. We were accompanied as far as the lighthouse by the governor and several of the officials. As soon as their boats were clear of the ship, the order was given to set sail, and put on full steam. I can even now remember the pleasurable emotions I experienced at that moment. There are some events in our lives which, although of trivial import, remain impressed upon the memory as long as reason holds its seat. Such a one was this.

The sailors have brought the topsail halyards to the capstan, round which they cluster like bees, seeming to sing with more than usual spirit, that famous chorus of "Cheerily men!" familiar to all who go down to the sea in ships, keeping time to the sharp click of the windlass. Then as the ponderous yard slowly rises, and the heavy folds of the topsail swell out to the breeze, we mutter to ourselves these glorious words—homeward bound, homeward bound. Ah! what a world of thick-coming fancies crowd upon us now. What wishes, hopes, and fears, do these words suggest. Visions of the past, visions of the future, of the days before we left the shores of England, and of those scenes we hope soon to revisit; and far above all, the pleasing anticipation of seeing again the friends from whom we have been so long parted. What if at that moment a true mission could have shewn us, as in a glass, our own anxious faces, as we eagerly perused the letters awaiting our arrival at Liverpool, or the sickening sensation that came over us as we laid them aside; for they told us how some were sick even unto death, and others had fallen asleep.

Thus musing we cast our eyes towards the sterile shores we have quitted, and nothing remains but a low misty outline, hardly to be distinguished from the heavy bank of clouds which hangs over it. We left the Falkland Islands without regret.

A PEEP AT THE FERNS, ETC., OF SUTHERLAND AND ROSS.

BY W.

(Continued from page 32.)

My stay at Durness was now over, and I set sail for Dingue, on board a highland pony, on Friday, August 16th. The road winds along the sea-coast for several miles, and the country presents much the same appearance as that round Durine. Towards Loch Eribol the rocks in a

great measure disappear, and the whole is one dreary waste of heather, sloping gently down to the Loch. On the opposite shore the rocks rise bold and steep in some parts from the water's edge. I crossed the Loeh, and had now ten miles to walk on foot, as my pony was sent back; at first, and as far as the River Hope, the road is interesting, twisting round the hills, rising bare and black in all directions, with a small Loch, now and then, to vary the scene. After crossing the Hope, which is done by a draw-bridge, the road passes up a steep rising ground, grown thick with birch and the more common Ferns, and out on a moor the most dreary and miserable that can well be imagined. Round and round as far as the eye can reach, nothing but heather without almost a single rock to break the monotony. On and on for several miles, without seeing any living being, except a solitary man on horseback, muffled up as if it had been in the midst of winter; I reached the highest part of the road, the Moine House. From this is got a fine view of Tongue, lying like an oasis in the desert, in gentle slopes from the rugged hills to the water's edge, and finely dotted with clumps of trees, amidst which shine the white houses and the green fields.

On reaching it, it did not belie its appearance. Every sense was regaled; the air was mild and perfumed with the sweet odour of the woods and flowers; the ear was greeted with the song of birds, broken in upon by the scream of the Common Tern and Oyster Catcher, mingled with the bleating of sheep and the lowing of cattle. Through the opening amongst the trees, on the one side, might be seen, lying calm as a sleeping infant, the Kyle, ringed with its low black hills; and on the other, the steep and broken sides of those that lie towards the north, while in front, in the far distance, toward Ben Loyal, and close at hand, rose up from the water's edge, a steep rock, crowned by the ruins of an old castle, where once the voice both of sorrow and mirth resounded, but whose very memory has now perished. Alas, for human greatness! a bubble on the ocean of time.

My road now lay through the eastern part of the county to Lairg. The whole district is a dreary waste of heather and loch; mile succeeds mile of dismal solitariness; not a hush to be heard, so that the silence becomes oppressive; now and then sweeps along a gust of wind with mournful howl, as if sorrowing for the desolation.

From the ditches by the side of the road I was gathering *Equisetum palustre*, *E. umbrosum*, *E. sylvaticum*, and *E. limosum*. A stout pair of legs and a happy heart soon put the road behind me, and I arrived in due time at Lairg, on the second day after leaving Tongue. From Lairg to Inverinn the road is beautiful, a fine mixture of hill, wood, water, heath, and field. The road after crossing the river that flows from the Loch to

Dornoch Frith, by a fine bridge, lately built, runs along its bank to Inverinn, now through bare moor, now through fine fields covered with rich crops, now through woods of fir, oak, beech, etc., now at the foot of high rocks a little above the stream, whose opposite bank rises to a great height, rugged and steep, and "feathered o'er" with birch, with the river here spreading out and running amidst huge rocks, now overhung with wood, now running between high steep rocks in black boiling pools, now over a ledge of rocks in white foam, now again with brawling noise among loose rocks, that have tumbled from its high banks. My intention was to lodge at said Inverinn, but

"The best laid schemes o' mice and men
Gang aft a-gley."

I was told I could not be accommodated. Nothing daunted, although I had already walked over twenty-six miles without halting, I resolved to walk to Bonar Bridge, about four miles farther down. Having taken in coals and water in the shape of a hearty tea, I got up steam, and proceeded at a fair rate, and arrived in due time at my destination. Next day my journey was to Tain, about eleven miles farther down the Frith, a short walk, as I was somewhat tired.

I was now in Ross, and the country becomes every mile more beautiful. The road winds along within view of the Frith, now close to it, now with a few trees between, now through a thick wood, now away from the Frith, with fine fields stretching to its shore; now through an uncultivated space beset with broom, etc.; now out of view of the Frith, through fields rich in crops of rye, wheat, oats, etc.; now hemmed in by dykes, overrun with the more common species of Fern; now at the foot of a steep slope, planted with various kinds of trees, and undergrown with broom, the brier-rose, foxglove, and Ferns. Away on the other side are dark green woods, interspersed with cultivated fields waving with yellow crops, and farm houses, and cottages, all backed by high hills. The whole line along the road is one great Fernery. I never saw them growing in such perfection.

Polypodium vulgare, *P. dryopteris*, *Lastrea filix-mas*, four feet in length, *L. dilatata*, as luxuriant, *L. spinulosa*, *L. oreopteris*, *Athyrium filix-fœmina*, in most magnificent crowns, *Polystichum lonchitis*, *P. angulare*, hanging in graceful festoons of two and a half or three feet long. From the crevices of the old red sandstone rock, *Asplenium adiantum-nigrum*, *A. trichomanes*, six or seven inches long; *Pteris aquilina* and *Cystopteris fragilis* reward half an hour's search.

I left Tain next morning for Invergordon. One would think he was walking through some nobleman's park. The roads are excellent, bordered by hedges and overhung with trees. The farms are highly cultivated, and laid off in parks, while the houses are mostly surrounded with trees, over-

topped by the brick chimney of the steam-engine of the thrashing-machine. The country gives a fine idea of a rich agricultural district, and will vie with any part of merry England. After a walk through the gardens and grounds of Tarbet house, I set out for Invergordon. I went on board the Queen Steamer, and landed at Burghead, thence I walked to Elgin. Here I viewed "the lions," the ruins of the cathedral, off which I gathered *Asplenium ruta-muraria*, and the museum, that is rising so fast in provincial specimens of Natural History. Thence I walked to Forgieside, near Keith. On my journey I gathered some fine specimens of *Equisetum Wilsoni*, from a ditch by the road side, at a place called Forgie Hill. Here I stayed for a few days collecting Coleoptera, and amongst them *Agabus uliginosus*, *A. bipustulatus*, *Halipus lineato-collis*; some species of *Bembidium*, etc., turned up, all to be given at some no distant period, to the readers of "The Naturalist."

I shall now take leave of my readers, with the humble hope that an account of what I saw may afford some pleasure to them, as the reality assuredly afforded to me the very highest, and still does when I wander over again in my imagination the wilds of Sutherland and Ross.

Macduff, September 16th., 1856.

LIST OF BUTTERFLIES AND SPHINGES OBSERVED AT LAUSANNE, SWITZERLAND.

BY THOMAS GEORGE BONNEY, ESQ.

THE following List of Butterflies and Sphinxes observed during the months of July, August, and September, at Lausanne, Canton de Vaud, Switzerland, and in other parts of that country and Savoy, may perhaps not be without interest to some of the readers of "The Naturalist." The figures 1 2 3, denote respectively the first, second, and third divisions of the ten days in the month.

- Papilio Machaon*. 3.—Never common: July and August.
Gonepteryx rhamni. 3.—Rare: July.
Colias edusa. 3.—Common: July, August, and September.
Colias hyale. 3.—Common: July, August, and September.
Pieris erataegi. 1.—Not uncommon, but going out: July.
Pontia brassicae. 1 2 3.—Very common: July, August, and September.
Pontia rapae. 1 2 3.—Very common: July, August, and September.
Hipparchia galathea. 1 2 3.—Not uncommon: July and August.
Hipparchia hyperanthus. 1 2 3.—Common: July, August, and September.
Hipparchia megæra. 1 2 3.—Common: July, August, and September.
Hipparchia tithonus. 3.—Not common: July.
Hipparchia janira. 1 2 3.—Very common: July, August, and September.

Hipparchia blandina. 3.—Not common: July.

Limnitis 2 3.—Not quite the same in its markings as *Camilla*.*

Rare: July.

Vanessa Io. 3.—Not common: July and August.

Vanessa urticæ. 1.—Not common: July and August.

Vanessa C-album. 2. 3.—Common: July, August, and September.

Cynthia cardui. 1.—Not common: but going out in July, coming in in September: July and September.

Apatura Iris, ? ? 3.—Did not see it myself, and rather doubt my informant's accuracy: July.

Melitæa 2.—Rare. Not an English species, about the size of *M. Euphrosyne*, and not very unlike it on the upper side, but with the under side like no English species: July.

Melitæa cinxia. 3.—Rare: July.

Polyommatus 2.—Only saw one or two specimens on the wing, most like *P. arion*, but as I did not succeed in taking a specimen, I can only conjecture: July.

Hesperia sylvanus. 2 3.—Not common: July.

Hesperia linea. 2 3.—Not common: July.

Anthrocera filipendulæ. 3.—Not common: July.

Anthrocera lonicæræ. 2 3.—Common: July.

Anthrocera minos. 1 2 3.—Not uncommon: July.

Macroglossa stellatarum. 1 2 3.—Very common, particularly near the vineyards: July, August, and September.

Sesia fuciformis. 1.—One specimen: July.

Additional Flies observed in the month of August:—

Hipparchia Aegeria. 3.—Rare: August and September.

Hipparchia pamphilus. 2.—Not common: August.

Hipparchia 2.—One specimen. It is not unlike *H. hyperanthus*, but is at least half as large again; the colour of the wings is the same, but on each of the fore wings there are two spots, (the upper pair being the smaller,) black with purple centres, on the under sides these spots also appear of the same colours, but are surrounded by a yellowish ring, which is hardly perceptible, if at all, on the upper side. On each of the hind wings there is a very small flat spot with a purple eye. The under side is rather lighter than the upper, and on the under side of the hind wings there is a row of darker marks arranged symmetrically with respect to the edge of the wing: August.

Leucophasia sinapis. 1 2.—Not common: August.

Vanessa Antiopa. 1.—Only one specimen, which I had the good fortune to capture; it was flying along a little water-course between two high walls

* *Camilla*? and read "not quite the same as *Sibylla*."—F. O. MORRIS.

enclosing orchards and vineyards, close to Lausanne. It was in splendid condition: August.

Polyommatus alexis. 3.—Common: August and September.

Polyommatus corydon. 2.—Not common: August.

In the month of September:—

Vanessa atalanta. 1.—Not common.

Argynnis Lathonia. 1.—Rare.

During a week's tour in Savoy and Canton Vallais, in the middle of August, I saw, besides most of those mentioned above as occurring at the time, the following Flies:—

Hipparchia blandina. Very common.

Hipparchia cassiope. Very common.

Melitæa Dia. Not uncommon near Chamouni, among other places near the Mer de Glace.

Argynnis aglaia. Common.

Parnassius Apollo. I saw about five specimens on the road between Chamouni and Martigny, but was informed that it was late for them. I also saw about five specimens of this or a kindred species, between St. Pierre and the Hospice of the Great St. Bernard; their markings were nearly the same as *P. Apollo*, but they were all very much smaller, not being larger specimens than *P. brassicæ*. Is this due to the difference of temperature? These I suppose were from six to seven thousand feet above the sea; the others between three and four thousand feet.

Hesperia malvæ. Not common.

I also saw the caterpillars of *Acherontia atropos*, and *Chærocampa Nerii*.

Churchdale House, Rugeley.

ENTOMOLOGICAL CAPTURES IN 1856.

EXTRACT FROM A LETTER TO THE EDITOR, FROM THE REV. R. P. ALINGTON.

SUGAR as well as net has been a sad failure this year, so meagre indeed have been the results of my sport, that had you not particularly requested me to inform you of my success, I certainly should not have thought it worth while to commit it to paper. Having had great luck last season I commenced this with great expectations; alas! my hopes have been woefully disappointed. I have been informed by others that they have experienced a like failure; even *A. pistacina* has been scarce; of *Mormo maura*, and *Thyatira batis*, (so common last season,) I have not taken a single specimen. However, "pour commencer,"—on the 11th. of February I first sugared my two trees, and worn out *Satellitias* were the result. The following night a large moth hovered round my lamp, and settled

heavily on the tree; as I had not sugared so early last season I was most anxious to capture it. It proved only to be an old friend of last autumn, namely, *C. exoleta*.

I continued to take these two flies until the 19th. of April. On the 1st. of March, with net:—*H. capreolaria*, (Dotted Border;) *H. rupicaprararia*, (Small November;) *H. defoliaria*, (The Umber;) and *A. æscularia*, (March Moth,) on the 19th. On the 2nd. of April saw the first *Gonepteryx Rhamni*, (Brimstone Butterfly;) and had *S. gothica*, (Hebrew Character,) out of chrysalis. On the third took with sugar *T. munda*, (Twin-spotted Quaker;) *T. stabilis*, (Common Quaker;) *T. instabilis*, (Clouded Drab;) of *Munda* I only took one pair. On the 5th. *Gothica* very numerous. I continued to take these flies until the 22nd.

On the 16th. captured the first *P. cruda*, (Small Quaker;) and on the 17th. a single specimen of *P. meticulosa*, (Angleshade.) On the 21st. saw the first White Butterfly, and *V. Io*, (Peacock;) on the 22nd. Common Carpets, (*M. fluctuata*;) and *G. illunaria*, (Early Thorn.) On the 24th. *H. suffumata*, (Water Carpet,) and *M. ferrugata*, (Red-barred Twin-spot.)

May 10th. *A. derivata*, (Streamer;) on the 13th. I was at Stockton Common, *A. myrtilli*, (Beautiful Broad-bordered Orange Underwing;) *F. atomaria*, (Common Heath;) and *Thecla rubi*, (Green Hairstreak;) I observed also *A. cardamines*, (Orange-tip Butterfly,) for the first time. In the evening took *A. badiata*, (Shoulder-stripe;) on the 20th. took caterpillars of *O. patatoria*, (Drinker Moth,) and *A. caga*, (Garden Tiger;) saw specimens of *H. aegeria*, (Speckled Wood Butterfly,) worn out. On the 22nd. *S. libatrix*, (Herald,) with sugar; and on the 24th. *B. betularia*, (Pepper,) out of chrysalis.

On the 26th. took larvæ and chrysalides of *M. artemis*, (Greasy Fritillary,) very plentiful on Friesthorp Ings, near Market Rasen; most of the former struck with the Ichneumon; also *M. Euphrosyne*, (Pearl-bordered Fritillary;) *P. purpuralis*, (Purple and Gold;) *S. clathrata*, (Laticed Heath;) *P. marginata*, (Clouded Border.) On the 27th. took *Bapta punctata*, *S. paniscus*,* (Spotted Skipper;) *Lozogramma petraria*, (Brown Silver-lines;) *S. mendica*, (Muslin Moth.) On the following day many *Libatrix* at sugar.

June 2nd. *T. strigularia*, (Engrailed Moth;) *S. fuliginosa*, (Ruby Tiger;) *S. lubricipeda*, (Buff Ermine;) and three species of Long Horns. 4th. *O. bidentata*, (Scalloped Hazel;) *T. crepuscularia*, (Engrailed;) very common, sticking to the stems of the Scotch Fir. *M. lituraria*, (Tawny-barred Angle;) *P. plumbaria*, (Belle Moth;) *F. piniaria*, (Bordered White;) *C. simulata*, (Bride's Carpet;) *T. dubitata*, *A. remutata*, (False Riband Wave;) *E. pendularia*, (Birch Mocha.) 7th. *O. pudibunda*, (Pale Tussock,) out

* Yes—a new locality for it.—F. O. MORRIS.

of chrysalis; *Artemis* on the wing in profusion; took *E. mi*, (Shipton.)

On the 11th. *E. glyptica*, *E. dolobraria*, (Scored Wing;) *C. marginaria*, (Small Emerald;) *P. gamma*, (Silver Y.) At this time varieties of common flies almost without number appeared on the wing, of which perhaps the most numerous might be *C. pusaria*, *C. biliniata*, and *M. montanata*. On the 21st. *A. ulmata*, (Scaree Magpie,) and *Z. albicillata*, (Beautiful Carpet,) very plentiful; also *G. Rubricollis*, (Red Neck.)

On the 17th. at Linwood, near Market Rasen, *P. iota*, (Gold Y;) *N. Russula*, (Clouded Buff;) common: *N. plantaginis*, (Wood Tiger;) *M. hastata*, (Argent and Sable;) *E. undulata*, (Shell Moth;) *A. luteata*, (Yellow Wave;) *B. jacobæa*, (Cinnabar;) *G. mesomella*, (Four-spotted Footman;) *P. falcula*, (Hook Tip;) took also caterpillars of Emperor Moth. In the evening with net, *S. ligustri*, (Privet Hawk;) *C. porcellus*, (Small Elephant Hawk;) *H. brassicæ*, (Cabbage;) and *X. rurea*, (Clouded-bordered Brindle.)

28th. *H. prasinaria*, (Silver Lines;) *S. fuciformis*, (Broad-bordered Bee Hawk;) *H. proboscicalis*, (Snout Moth.) On the 30th. *P. linea*, *P. sylvanus*, (Skippers;) *L. comma*, (Dark Straw;) and *M. dentina*. July 2nd. took a pair of *D. pudibunda*, also *A. fillipendulæ*, (Six-spot Burnet.) 12th. *L. Lithargyria*. 16th. *T. pronuba*, (Orange Underwing;) *X. lithoxylea*, (Light Arches;) *E. lucipara*, (Small Angle Shades;) *X. polyodon*, (Dark Arches.)

On Thursday the 17th., I, in company with my nephews, went to Linwood, near Market Rasen, where we took *G. miniata*, (Pink Arches;) *G. Papilionaria*, (Large Green Emerald;) *H. cythisaria*, (Grass Emerald;) *P. bajularia*, (Blotched Emerald;) *N. russula*, (Clouded Buff;) worn out: also worn out *M. hastata*, (Argent and Sable;) *E. undulata*, (Shell Moth;) *E. fasciaria*, (Barred Red;) *N. dictæa*, (Swallow Prominent;) *P. iota*, (Gold Y;) *O. chærophyllata*, (Sweep;) *H. prasiana*, (Silver-lines;) *A. lonicæa*, (Five-spot Burnet;) *S. psi*, (Dagger Moth;) *A. aglaia*, (Dark Green Fritillary.) In the evening on honeysuckle, *S. ligustri*, (Privet Hawk,) seven specimens; two of *C. porcellus*, (Small Elephant Hawk;) *C. elenor*, (Large Elephant;) also *A. advena*, (Pale-shining Brown;) *H. brassicæ*, (Cabbage Moth;) *C. nigrum*, and about fifty other varieties.

On the 19th. *O. patatoria*, (Drinker;) *L. quercus*, (Large Egger;) and *A. rumicis*, (Bramble Moth,) out of chrysalis. I have taken the latter fly early in June. 24th. *S. gothica*, (Hebrew Character;) *M. strigilis*, (Marbled Mirror;) *P. chrysitis*, (Brass-wing;) *P. salicis*, (Satin Moth;) *P. auriflua*, (Gold Tail.) 29th. *O. sambucaria*, (Swallow-tailed Moth;) *C. graminis*, (Antler Moth.)

August 7th. *Umbratica*; 11th. *Nictitans*, (the Golden Eye;) 14th. *M. stellatarum*, and *S. ravida*; 15th. *V. polychloros*, (Large Tortoise-shell;) 23rd. *T. orbona*, (Lesser Yellow Underwing;) 25th. *O. tragopogonis*, (Mouse,) and *C. elingvaria*, (Angle Dot,) common. 29th. more flies at sugar than usual,

many Angleshades, Mouse Moths, Orange Underwings, etc., etc. 31st. *V. Io*, (Peacock,) and *C. album*, (Comma.)

September 2nd. *A. suffusa*, (Dark Sword-grass;) 4th. *P. Pyramidea*, (Copper Underwing;) 8th. *C. cubicularis*, (Pale Mottled Willow,) *A. lunosa*, (Lunar Underwing,) *A. litura*, (Brown Pinion-spot,) *O. macilenta*, (?) *Z. cerago*, (Light Sallow;) 17th. *Z. silago*, (Barred Sallow,) *N. typica*, (Dark Gothic,) *X. rufina*, ? (Flounced Rustic,) *M. oxyacanthæ*, (Green-brindled Crescent,) Angleshades, *Lunosa*, *Litura*, *Suffusa*, and *Ferruginea* in abundance. 24th. *Protea*, (Brindled Green;) 26th. *H. achatinaria*, (the Chevron.)

October 4th. *M. oxyacanthæ*, very abundant; 5th. *V. atalanta*, (Red Admiral;) 10th. *G. spadicea*, (Dark Chesnut,) *Satalitia*, Red-lined and Common Quaker, and *C. nigrum*, common. 12th. *Exoleta*.

The above is a *very* useful list, both as regards the flies themselves, and as a guide to their contemporaries.—F. O. MORRIS.

NOTICE OF THE DIURNAL LEPIDOPTERA IN MY NEIGHBOURHOOD.

BY MR. GEORGE STOCKLEY.

I HAVE always thought local lists of insects to be of great value, as by that means entomologists living at distant and various parts may each know the species peculiar to certain districts, which, without, many would not have the means of ascertaining; consequently, if they should at any time visit those localities, much valuable time might be lost in not knowing where to look for species in their proper places.

The above is my apology for sending the following, hoping it may prove useful to some of your entomological readers.

First, a word or two about my neighbourhood; Wanstead, with the surrounding district of Hainault Forest, is the locality which I include in the above term, which, though I do not live there, still the many happy rambles I have enjoyed in its woods will certainly entitle me to call it so. The district mostly consists of a gravelly or sandy soil, the former place especially, while the latter forest is in many places very boggy; in summer these boggy places are a favourite resort for the *Argynis euphrosyne* and *Thanaos tages*. The trees consist in the Wanstead portion mostly of limes, elms, whitethorns, and oaks; those in the Hainault portion being mostly hornbeam and oak.

Gonepteryx rhamni.—Common in all parts in spring and summer.

Colias edusa.—Saw one specimen on the wing near Canhall lane in August some years back.

Anthocharis cardamines.—Abundant in May and June.

Leucophasia sinapis.—Very local; occurs in a few places in Hainault during May and August.

Arge galathea.—A very local species, occurring in one or two boggy places in Hainault Forest in July.

Lasiommata aegeria.—Common in the woods in May.

L. megæra.—Common everywhere in May.

Hipparchia janira.—Abundant; July.

H. hyperanthus.—Abundant; June.

H. tithonus.—Abundant; July.

Cænonympha pamphilus.—Abundant; June.

Cynthia cardui.—Occurred rather plentiful near Wanstead in 1844; scarcely seen since.

Vanessa urticae.—Abundant everywhere.

V. atalanta.—Common at Wanstead in September.

V. Io.—Common at Wanstead in August.

V. polychloros.—Occurs near Hainault in July; not common.

Argynnis paphia.—Occurs in Hainault Forest, but is very scarce; July.

A. euphrosyne.—Common in many parts of Hainault in June.

Thecla quercus.—Though I have often found the peculiar larvæ of this species, the perfect insect seems scarce. It is abundant in Darenth Wood in July.

T. betulae.—Observed one specimen at Hainault in September some years back.

Chrysophanus phlæas.—Common everywhere during summer.

Polyommatus argiolus.—Very local, though annually abundant in the woods near Wanstead, hovering around the holly in the beginning of May. A second brood is said to occur in August. I have not found it to be so here, as I have often searched for the insect in the latter month without success.

P. alexis.—Abundant everywhere during summer.

P. agestis.—Scarce near Wanstead in July.

Thymele alveolus.—Common on Wanstead Heath in April.

Thanaos tages.—Common in the open heathy glades of Hainault Forest in May.

Pamphila sylvanus.—Common in the lanes throughout the district; July.

P. linea.—I have entered this species in the list as it may occur here, though I have not observed it; it is plentiful in Darenth Wood in July.*

* Since writing the above I am almost sure I have a specimen of *P. actæon* taken here last July.

With the foregoing I conclude the list of Butterflies which I have as yet observed here. If it should prove acceptable I will send a similar one of some of the *Noctuæ*.

2, *Leachdale Place, Old Ford, July 21st., 1856.*

CONTRIBUTIONS TO AN ENTOMOLOGY OF BANFFSHIRE.

BY W.
BUTTERFLIES.

THIS may appear to the readers of "The Naturalist," a high-sounding extensive heading. It is; but my motto always is, "Bode a gown o' silk, and ye'll be sure o' a slieve o't." Here then is the first bode, in shape of a list of the Butterflies. Whether the "gown" come time will tell. It is not meant that time + I = the task; but it is hoped that time + the help of kind friends + I = an approximation of a list of the more common classes of insects to be met with in the county and part of the surrounding district. If labour can do anything to accomplish the task, it shall not be wanting on my part, if Providence cast my future lot within it, (for I am not yet "settled in life") and spare me health. Whether the district is rich in entomological stores remains in a great measure to be seen. In Butterflies, as the list testifies, it is far from rich; in moths it may stand better; and in beetles it may prove fair.

The arrangement and nomenclature are those of "Stainton's Manual."

Large White, (*Pieris brassicæ*).—Is most abundant, and has been caught in fine preservation as late as the end of September.

Small White, (*Pieris rapæ*).—Is often too plentiful, to the cost of many a "kailyard," and to the sore displeasure of many a thrifty "guidwife." It is very variable; one I have is pure white, without any spots in the fore wings; another, a female, of a pale yellowish colour, very thickly dotted both on the fore and hind wings towards the body. A third, a male, with the black mark on the costa of hind wing scarcely perceptible; others with some other peculiarity, scarcely any two of them are alike.

Green Veined, (*Pieris Napis*).—Though common, this one, in my experience, is not so plentiful as its congeners.

Orange Tip, (*Anthocaris cardamines*).—Is rather common.

Grayling, (*Hipparchia semele*).—This Butterfly, although not found within the precincts of the county, is found in Moray, and will no doubt be found in the upper districts, that are quite of the same nature of country as Moray.

Meadow Brown, (*Hipparchia janira*).—In profusion all over the county,

from the boggy parts close on the sea shore, to the peat bogs in the highlands of Banff. Great variation of size, colour, and markings characterize this species. Sometimes it is of a light brown, with one and two spots; sometimes of a dark glossy brown, with a very small spot. In the female the fulvous patch is sometimes small, at other times large; in some it is of a light colour, in others it is dark.

Heath Butterfly, (*Cænonympha davus*.)—The same remark applies to this species as to *Hipparchia semele*.

Small Heath, (*Cænonympha pamphilus*.)—Quite common in the upper parts, but not so plentiful round Banff.

Painted Lady, (*Cynthia cardui*.)—Is said to have been found a good many years ago.

Red Admiral, (*Vanessa atalanta*.)—Is found, but not in very great plenty. Two years ago I found a very fine specimen in a garden in Macduff; since then I have not seen a single individual.

Small Tortoise-shell, (*Vanessa urticæ*.)—In great abundance. A sunny day in spring I have seen bring out, long before any of the others, those of them that had hibernated. This season, cold as it is, I saw them flitting about in sunny nooks, about the middle of September.

Dark Green Fritillary, (*Argynnis aglaia*.)—A single specimen of this insect was caught by Dr. Bremner, Jun., Huntly, in the parish of Gartly, on the banks of a small stream.

Small Pearl-Bordered Fritillary, (*Argynnis selene*.)—I set this down as the *Melitæa selene* of Stephens, although this synonyme is not given by Mr. Morris. A single specimen of this now lies before me, from the same place as the former.

Pearl-Bordered Fritillary, (*Argynnis euphrosyne*.)—Is rather scarce in some districts.

Greasy Fritillary, (*Melitæa artemis*.)—Has been found on the Binn Hill, a large rugged wooded hill that lies between Keith and Huntly. Dr. Bremner, of Huntly, had the kindness to send me a specimen.

Green Hairstreak, (*Thecla rubi*.)—Was found in great plenty this summer on the Hill of Baads, near Macduff. Its habitat was an open benty space in the middle of a fir wood that covers the hill. Mr. Lemon, who first found it, brought me two specimens. Dr. Bremner finds it near Huntly.

Small Copper, (*Chrysophanus phlæas*.)—This little beauty is quite common. With respect to the district round Macduff, I have observed it in great plenty during some seasons; at other seasons scarcely one is to be met with. This summer I saw only one or two.

Little Blue, (*Polyommatus albus*.)—Is occasionally got.

Common Blue, (*Polyommatus alexis*.)—Is common everywhere. Right pleasant it is to be on a grassy bank with the song of the lark overhead,

and the bees buzzing past, to watch those beautiful creatures in the full tide of happiness, flitting about from blade to blade of grass, and from flower to flower, now opening and now closing their wings.

“A thing of beauty is a joy for ever.”

At such times one may feel a kind of sorrow when two are seen to meet in battle. They rush on each other with right good will, buffet each other, fly over and over each other, now up, now down, away then on the breeze, till the one takes to flight, and leaves the other “alone in his glory.” This pugnacity I have also observed in the Whites, if pugnacity it is. It may be only a tilt for amusement, something to kill their time, in imitation of those human butterflies that make life all amusement, (what a misuse of the word!) and must try something, and will try anything to make that pass, they should keep longest.

Dingy Skipper, (*Thanaos tages*.)—A specimen lies before me from Birnie, Morayshire.

Of the foregoing I have seen specimens, except of *C. cardui*. To this small proportion of British Butterflies time may add a few more, perhaps of the Blues.

The next ‘bode,’ I hope, may prove more interesting, in the form of lists of the Beetles, both Geodephagous and Hydradephagous. Now, that no longer

“Vital power,
Productive energy, abroad are rife,
Investing all things with the hues of life,”

We must fight our battles over again, in naming, arranging, and preparing notes on the summer captures; and these shall be presented to the readers of “The Naturalist” when matured.

Macduff, September 30th., 1856.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 61.)

Mephitis leuconota, <i>Licht. Schinz.</i>	Mephitis Amazonica, <i>Licht. Schinz.</i>
Mephitis mesoleuca, <i>Licht. Wag. Schreb.</i>	Conepatus Humboldtii, var. <i>Gray.</i>
<i>Schinz. M. nasuta, Benn.</i>	Mephitis Molinæ, <i>Licht. Schinz.</i>
Mephitis Chilensis, <i>Licht. Schinz. M.</i>	Mephitis Quitensis, <i>Schinz. Gulo Qui-</i>
<i>furcata, Wag. Schreb.</i>	<i>tensis, Humb. Licht.</i>
Mephitis suffocans, <i>Licht. Schinz. M.</i>	Mephitis Gumillæ, <i>Licht. Schinz.</i>
<i>Feuillei. Gulo suffocans, Illig.</i>	Mephitis mesomelas, <i>Licht. F. Cuv.</i>
Mephitis Patagonica, <i>Licht. Schinz.</i>	<i>Schinz.</i>
Conepatus Humboldtii, <i>Gray.</i>	Mephitis macroura, <i>Licht. Schinz.</i>

- M. Mexicana, *Gray*.
 Mephitis Chinga, *Licht. Schinz.* M.
 Americana, var *Hudsonica*, *Rich*.
 Viverra mephitis, *Linn. Schreb*.
 Mephitis vittata, *Licht. Schinz.* M.
 varians, *Gray*.
 Mephitis Zorilla, *Licht. Schinz.* M.
 bicolor, *Gray.* Viverra Zorilla,
Schreb.
 Mephitis interrupta, *Rafin. Licht.*
Schinz.

HELICTIS.

- Helictis personata, *Schinz.* Melogale
 personata, *Guerin*.
 Helictis fusca, *Schinz.* Gulo orientalis,
Horsf. Mydaus macrourus, *Temm*.
 M. orientalis, *Müll.* Melogale fusca,
Guerin. Wag. Schreb.
 Helictis moschata, *Gray. Schinz.*
 Helictis nepalensis, *Schinz.* Gulo ne-
 palensis, *Hodgson*.

RATELUS.

- Ratelus capensis, *Schinz.* Gulo capen-
 sis, *Desm.* Viverra capensis, *Schreb*
 Meles melliavora, *Thunb. Cuv*.
 Ratelus indicus, *Schinz.* R. mellivorus,
Bennet. Ursus indicus, *Shaw. Hard.*
 Ursitaxus inauritus, *Hodgson*.

GALICTIS.

- Galictis barbara, *Schinz.* Mustela bar-
 bara, *Linn. Prinz Max.* M. Gulina,
Schinz. Gulo barbatus, *Desm.* G.
 barbarus, *Rengg.* G. canescens, *Illig.*
 G. taira, *F. Cuv.* Viverra poliocep-
 hala, *Trail*.
 Galictis vittata, *Schinz.* Viverra vit-
 tata, *Schreb.* Gulo vittatus, *Desm*.
 Galictis allamandi, *Bell. Schinz.*

RHABDOGALE.

- Rhabdogale mustelina, *Schinz.* Viverra
 striata, *Shaw.* V. Zorilla, *Thunb*.
 Mustela Zorilla, *Cuv. Desm. Fisch.*
 Mephitis Africana, *Licht.* M. Zo-
 rilla, *Licht*.

MUSTELA.

- Mustela canadensis, *Schreb. Cuvier.*
Fisch. Richardson. Schinz.
 M. Pennanti, *Lewis & Clarke, Fisch.*
 Mustela flavigula, *Benn. Bodd. Schinz.*
 M. Hardwickii, *Horsf.* Viverra
 quadricolor, *Shaw*.
 Mustela Martes, *Linn. Desm. Pallas.*
Richardson. Bonap. Schreb. F. Cuv.
Schinz. Martes abietum, *Ray*.
 Mustela Foina, *Pall. Bon. Desm.*
Schinz.
 Mustela Zibellina, *Linn. Schreb. Pallas.*
Schinz. Viverra Zibellina, *Shaw*.
 Martes Zibellina, *Brisson*.
 Mustela melampus, *Wagner. Schreb.*
Schinz.
 Mustela leucopus, *Kuhl. Schinz.* M.
 leucotis, *Griff. Fisch.*
 Mustela vulpina, *Rafin. Fisch. Schinz.*
 Mustela Huro, *F. Cuv. Is. Geoff. Fisch*
Schinz.
 Mustela rufa, *Desm. Is. Geoff. Schinz.*
 Mustela sinuensis, *Humb. Desm.*
Schinz.
 Mustela calotus, *Hodgson. Schinz.*
 Mustela Putorius, *Linn. Schreb. Bell.*
Desm. Pallas. Cuv. F. Cuv. Schinz.
 Mustela Eversmanni, *Lesson. Schinz.*
 Mustela Furo, *Linn. Schreb. F. Cuv.*
Desm. Lesson. Fisch. Schinz.
 Mustela sarmatica, *Pall. Schreb. Cuv.*
Desm. Fisch. Schinz.
 Mustela sibirica, *Pall. Schreb. Desm.*
Cuv. Schinz.
 Mustela nudipes, *Desm. Schinz.* Pu-
 torius nudipes, *F. Cuv*.
 Mustela alpina, *Gebler. Fisch. Schinz.*
 Mustula Kathia, *Hodg. Wag. Schinz.*
 Mustela subhæmachalana, *Schinz.* Pu-
 torius subhæmachalanus, *Hodgson.*
Wag.
 Mustela frenata, *Licht. Schinz.*
 Mustela Erminea, *Linn. Schreb. Schinz.*

Miscellaneous Notices.

Wild Cat.—One of the largest specimens of the Wild Cat ever killed in this country, (Scotland,) is to be seen in the shop of Mr. Ingram, gun-maker, 100, Union Street, Glasgow. It was trapped on the shooting-ground of Mr. Dennistown, of Golfhill, Caithnesshire. It measures four feet from the nose to the tip of the tail, and when caught weighed twenty-two pounds.—*N. B. Daily Mail.*—J. Mc. INTOSH, The Grove, January, 1857.

Great Black Woodpecker, (*Picus martius*.)—Vol. i., page 20, I have recorded the existence and breeding of this bird in England, particularly in the county of Surrey. This announcement, the readers of "The Naturalist" will remember, was met by some of our learned zoologists as an attempt on my part to "gull," and that I had mistaken a *Tom-Tit* for a Black Woodpecker. How far I have gulled! the readers of "The Naturalist," the following little fact will speak for itself:—In July, 1856, I paid a visit to a particular friend in Surrey, and having occasion to pass the well-known "Black Bear Inn," at Esher, I pulled up to refresh myself, when, on entering the door, what caught my eyes but a fine specimen of a "Black Woodpecker," which I then remembered having, while I resided at Claremont, been shot by Mr. Storey, in whose possession it still remains. In conversation with Mr. Storey about this bird, and others in his possession, he informed me that some gentlemen from London, who professed to have some knowledge of birds and Natural History, (?) had the impudence to assert that he never shot the bird in question in the county of Surrey. Now every bird in Mr. Storey's possession has been shot by his own hands, and in the county of Surrey. What is, after this, the value of mere assertion made by *bookworm Zoologists*?—Idem.

The Crested Grebe, (*Podiceps cristatus*.)—A fine young specimen of this bird was shot by myself off Brighton a fortnight ago. This bird is by no means common in these islands. The young in their first plumage are without the crests and tufts.—FRANK C. D'ALQUEN, 8, Montpellier Terrace, Brighton, January, 1857.

Attachment of the Nightingale to young of its own species.—Mr. Wagget, a piano-forte tuner in this town, had a male Nightingale in confinement, and having found the nest of a Nightingale with two young ones, placed it in the cage with his bird; and, strange to say, the old bird brought up the other two, one of which is now alive and in fine condition.—Idem.

Notices in Zoology.—Bats flying on 27th. February; some Rooks' nests ready with eggs on the 18th. March; 19th., Boat Beetles rising; 6th. April, some young Crows hatched; 9th., heard Chiff-Chaff; 17th., Summer Snipes; 21st., Cuckoo; 28th., Swallows.—R. P. ALINGTON, Swinhope Rectory, 1856.

Hybernating Papilionidæ, etc.—I have at the present time flying about in, apparently, the full enjoyment of good and sound health, *Gonepteryx rhamni*, (Brimstone,) *Pontia Brassicæ*, (Cabbage,) *Vanessa Atalanta* and *Io*, (Admiral and Peacock Butterflies,) with four *Musca domestica*, or House Fly, under a globe-glass, in which I have growing a nice plant of *Lycopodium apodum*, in my sitting-room. Query, may not this little fact be turned to account by those who have time and leisure? D.V. I shall pay more attention to this subject this autumn myself, and record the results in the pages of "The Naturalist."—J. Mo'INTOSH, The Grove, January, 1857.

Review.

Blunders in Behaviour. London: GROOMBRIDGE AND SONS, Paternoster Row. Price Sixpence.

A NATURALIST, it must be taken for granted, is, and must be, at all events one of "NATURE's gentlemen." It is not therefore for me, as their guide in the fashions of nature, to suppose but that every one of my good readers is perfect in politeness—a very Chesterfield improved upon, as I am quite sure he (Chesterfield I mean) might be much and easily. Nevertheless, perhaps some of their acquaintance, if themselves do not, may require a few "Hints on Etiquette," in a second and much improved edition, as it were, of "Agogos," and for their behoof I bring under their notice the work whose title is prefixed. Some reviewers think, or seem to think, that they shall only shine as such by finding every possible fault they can, whether justly or unjustly, with the works they have to speak of. Others have to strain a point to speak well of any. In the present instance there is no fault to be found, nor any difficulty in speaking well of this "littell booke." It is a capital "brochure," and you will lay out sixpence well, or many sixpences, in giving it to those of your friends who are deficient in any point of politeness, especially the young.

The Querist.

IN a little book, published some time ago by Binns and Goodwin, of Bath, on the Eggs of British Birds, by C. Jennings, mention is made of the Nettle-Bird and the Gorse-Bird. Will you kindly inform me, through the medium of "The Naturalist," what birds she means, as she has not given the scientific names in addition to those mentioned.—T. R. SIMONDS, Brighton, January 22nd., 1857.

I presume that the Whitethroat or Nettle-Creeper is the species intended by the Nettle-Bird. What the Gorse-Bird is I do not know.—Perhaps the Stonechat.—F. O. MORRIS.



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digested with equal taste and judgment by the learned authors, indissolubly associated in fame and remembrance, as they were in life-long friendship, though now for a little while separated by a temporal change. To the survivor of the two we owe a very charming addition to the volume, in the shape of letters and recollections connected with the first conception and progress of the work, and the cordial friendship which, having originated and matured the undertaking, so long survived its completion and participated its success."—NATURAL HISTORY REVIEW, *July*, 1856, p. 51.

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Communications have been received from CAPTAIN J. M. JONES;—G. R. TWINN, Esq., two;—W.;—T. FULLER, Esq.;—J. GATCOMBE, Esq.;—MR. C. WILKINSON;—J. C. THYNNE, Esq.;—R. GRAY, Esq.;—W. FALCONER, Esq.;—F. M. BURTON, Esq.

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SWALLOWS.

BY O. S. ROUND, ESQ.

(Concluded from page 71.)



THE next species which visits us during the summer months, is the Sand or Bank Martin, (*Hirundo riparia*.) This, the smallest of the whole genus, is mouse-colour above and white beneath. He makes his nest usually on the banks, or rather in the banks of streams, which in autumn are perfectly swarming with these birds, as every angler can testify. This little creature, small and weak as he is, bores a hole into the sand, of two feet or more in depth, and big enough to admit his own body twice over. At the extremity a hollow is formed to receive the nest, which is made of hay or dry grass and feathers, and in which six white eggs are usually laid. The passage to the nest is seldom in a direct line, but whether this arises from some difficulty that has compelled the little borer to turn aside, or for safety, is not very clear. In hot weather this retreat is necessarily very warm and close, and accordingly forms a suitable situation for insect transformation, and accordingly is infested with a small animal peculiar to these birds, which Mr. Curtis has called *Pulex bifasciatus*.

That they breed twice there is no doubt, and it may be a question whether some do not even produce a third brood; but this would require a very nice observation to determine; the immense number produced only raises such a probability, from the period of their stay, which is, I should say, extended to the utmost limits of our summer visitants.

These little birds have a curious flitting kind of flight, and have been named by Spaniards *Papilion di montagua*, or Hill Butterfly. Their only cry is a harsh chirp. They come with the Martins about the end of April, but do not retire before the middle of October; and from their residence in wet, and therefore colder situations, are probably more hardy.

This species of Swallow is by far the least sociable, and seldom takes up its abode near the habitations of man; there are of course exceptions, but "*exceptio probat regulam*," and I may therefore be pardoned for mentioning one. On that part of the great western road which is between Egham and Shrub's Hill, about nineteen miles from London, there is, as every one who has travelled that way knows, a very steep hill, called by old coachmen, "Virginia Water hill;" so called from being opposite that ornamental lake in the south-east corner of Windsor great park; formed by George the Third, and a great delight to his successor during the latter years of his reign. In the sides of this hill, abutting on the road, an extensive colony of these birds had existed for many years; but as the banks from being too steep were continually falling in, and slipping from time to time, it was found necessary to shelve them off, to prevent the recurrence of the

evil; an operation which, in these railway days, we are very familiar with. This of course made sad havoc among the poor little birds' dwellings, which were almost entirely destroyed. From passing the spot frequently I remarked the occurrence, which took place a little before their arrival in this country in the spring. The circumstance would probably have passed by unnoticed further, had not a person, who worked for us as a carpenter, who knew that I was curious about anything connected with Natural History, informed me that a colony of Sand Martins had established themselves in a loam pit in his garden. This was about the end of May in the same year, and putting the two circumstances together, I have little doubt that they were the exiled birds, for hardly any bred in the former spot that season; while, I suppose, the new colony could not consist of less than twenty-five pairs, and the distance between the localities was about two miles. But, what is more to my present purpose, the locality where they had established themselves was in a small garden, close at the side or back of a house, inhabited by an old man and woman, and their three sons, who were continually about the place, and so far from being disturbed by their presence, the Martins were extraordinarily tame; and I remember when I paid them a visit, whilst we stood within a few yards of the holes, the birds would come and go, and feed the young, who came to the mouths of the holes for air.

Another singular circumstance occurred with reference to these birds, which was a new fact in Natural History. The person in whose ground they had built was an observant character, and told me that when the young Martins could scarcely fly, or sit at the mouths of the holes, they were attacked and killed by Wheatears. This, I must confess, startled me a good deal, as I knew the Wheatear to be harmless, and an insectivorous bird. However, as he said these visits were not frequent, and uncertain, he would shoot one of the next intruders, and I might judge for myself. Accordingly, a few days after I received his Wheatear, which proved to be a Flusher, or Red-backed Shrike, (*Lanius rufus*;) the mistake therefore of a totally ignorant man was pardonable. But here was the fact, namely, the Butcher Bird proved to be a bird of prey, which, though assumed to be the case by naturalists, has seldom I believe been so directly proved. I stuffed the bird, but I was a young hand; it was not cased, and eventually became food for the moths.

There is but one more kind of Swallow which I have to name, and this is the Swift, or, as it is sometimes called, the Black Martin, (*Hirundo apus*;) that is, I speak of those familiarly known to us. As a flyer, I suppose no bird known has so great an extent or power of wing. The webs of the feathers are very stiff and oblique in their position, and particularly adapted for offering the least possible resistance to the air in one position, whilst they oppose the greatest in another.

Everybody has seen Swifts, but they are not nearly so familiarly known as the other kinds of Swallows, and the reason is two-fold. First, almost every individual dwelling has its pair or more of Swallows, and there are always several colonies of House Martins in every hamlet and town; whilst we very seldom find more than one colony, or two at the farthest, of Swifts, in any single district. And secondly, because whilst the building of the Swallow and Martin is notorious, the nesting of the Swift is carried on completely under cover, or in secret, as it were, in church steeples and other hidden places. And their motions are so quick that their very figure cannot be so distinctly seen as that of birds which are sometimes passive; and hence, although every one knows a Swift when they see it, it is merely known in passing, and we cannot help attaching a wild notion to its habits and mode of life, for there can scarce be supposed any limit to the aerial rambles of a creature which probably courses through the sky at a speed of sixty miles per hour! what rate he could fly at is quite another matter.

His body is remarkably small for the extent of his wing, but at the same time the shoulders are so very muscular, that he is evidently capable of enduring immense exertion without fatigue. His flight is generally easy, and he glides quite as much as he flies. Sometimes you may see whole parties of these birds at a vast height, preceding a heavy shower, feasting upon the higher flying insects, which the rush of air, caused by the approaching rain, drives before it; at other times they will glide along quite low. They never settle, at least so seldom that it is not an incorrect statement, as a general proposition; and never on the ground, for if they do they have great difficulty in rising again, for their feet and legs are very short and small, and the toes so jointed as to clasp together at the centre from four points, and eminently calculated to cling; hence they can crawl up any paling and under eaves with great facility.

Their colour is black entirely, with the exception of the chin, which is white in the cock bird and dull grey in the hen. The head and upper parts of the former are also covered with bronze reflections. The head is large and flat, and a projecting process is observable over the eyes, which are large and black. The mouth very much resembles that of the Nightjar; the tail is short and forked. The wings are extraordinarily and almost preposterously elongated, the quill feathers being as long as those of birds twenty times his bulk! Great doubts have been entertained whether this bird ever builds a nest at all, or rather, whether he ever collects materials for the home he provides for his young; for this so nearly resembles that of the House Sparrow, only much smaller, and is so often built in the same situations, that it is highly probable a summary ejection of the rightful owner takes place, or what is more probable still, an old nest may sometimes serve his turn just as well. Of these statements, however, we

can be by no means certain, for it only arises from the fact that no one has ever seen him collecting materials. I must say I cannot see very well how this could be seen, for any one who has ever watched these birds, must know how inconceivably rapid their movements are, and how difficult, nay, impossible, it would be to recognise any substance carried in their bills, unless it were large and very apparent. Besides it is by no means necessary for them to settle to collect materials, for feathers or hay may be easily had for the gathering-in *transition*, and without even pausing in their flight.

Their eggs are never more than two, which are white; and as Swifts never stay with us more than three months, they have only one pair each usually, though instances have occurred either of second broods, or late broods from some other reason, such as destruction of the eggs, etc. It is a very astonishing thought which presents itself when we reflect that a pair of helpless, blind, naked, young birds of this species, which are incapable of any voluntary motion in the beginning of July, should by the middle of August, be coursing over the boundless ocean to other realms, and fully qualified for the task; so kindly does the Creator adapt our corporeal powers to the exigency which they are called upon to meet.

The Swift has no note beyond a kind of harsh scream. He is either a bold or foolish bird, which, it were hard to say, for he is not intimidated by being repeatedly fired at, nor others by the fate of one; and often forms a habitation in a commonly frequented place, such as inn yards, the midst of a town, or the like; and the meanest cabins sometimes are infested by them. They have a manner, in the evening, of wheeling around the neighbourhood of their nests for an hour together, and their screams are both incessant and inharmonious.

When they have young it is their usual habit to carry such insects as they catch under their tongues, where they form a considerable lump, as any one who has shot them must have perceived.

There are several other kinds of Swallows, but four only have ever been classed as British birds; namely, the great White-bellied Swift of Gibraltar, (*Cypselus Alpinus*;) the Purple Martin, (*Hirundo purpurea*,) which is an American bird; the Spine-tailed Swallow, (*Hirundo caudacuta*,) an Australian species; and the Pratincole, (*Glareola torquata*.) But these are only occasional visitants, and cannot be called ours; I can therefore say nothing of them from personal experience, and shall only add that I myself saw a very fine specimen of the Alpine Swift, some sixteen years ago, which was preserved by Mr. Gould, being shot by Mr. Mumford, Chobham, Surrey, somewhere in that parish, and was then in the collection of Mr. John Wheeler, of Wokingham, near Reading, since deceased.

Pembroke Square, Kensington, December, 1856.

ON THE CLASSIFICATION OF THE ANIMAL KINGDOM BY THE DISTRIBUTION OF THE NERVES.

BY F. M. BURTON, ESQ.

(Continued from page 54.)

No. II.

WE have now arrived at the completion of the first great division of the animal kingdom—the *Acrita*; and have witnessed with interest the gradual development of various organic structures in these lower orders of life, from the sponges to animals possessing a regular digestive apparatus and highly-developed organs of generation; but as yet no mention has been made of the nerves. It must not be supposed, however, that the animals we have been considering do not possess a nervous system, but that, with the aid of the most powerful microscopes, they have not as yet been discovered. Professor Jones indeed hints at such a system existing in several of the more highly organized types, but always alludes to the subject with considerable doubt and hesitation.

We now come to the second great division of the Animal Kingdom—the *Nematoneura*, or animals with thread-like nerves, including the *Cœlmintha*, *Bryozoa*, *Rotifera*, *Epizoa*, and *Echinodermata*; and, in the words of the author, having hitherto seen “the digestive process carried on in canals simply excavated in the substance of the body, without any outlet for the discharge of superfluous matter,” (although this cannot be said of some of the higher types of *Polygastrica*, which, according to Ehrenberg, have a straight intestinal tube with a double orifice, though the author himself seems to throw doubt on the statement;) the nervous system either perfectly diffused through the tissues, or but obscurely visible in the most perfect species, and the sexes, with one exception, invariably combined in the same individual, we arrive at a point in the scale of animal development at which the nervous fibre becomes for the first time distinct and recognizable; the alimentary canal is visible as a separate and distinct tube, and the ovigerous and impregnating sexual organs are found to exist in different individuals. In the *Cœlmintha* we find animals very like the last family of the kingdom *Acrita*, but with a nervous system distinctly developed, and muscular fibre in a rudimentary state is now also recognisable. Their digestive apparatus consists of a simple tube running from an œsophagus right through the body, without any apparent division into stomach and intestine; and the animals are dioecious.

The *Bryozoa*, or Ciliobrachiæ Polyps, come next in order; and we have many varieties of them on our own coasts, the commonest of which is the *Flustra foliacea*. These animals resemble somewhat the unciliated

tubular Polyps spoken of before, and differ from them externally chiefly in having their tentacula covered with an immense number of vibrating cilia, which the latter, it will be remembered, never possess. In one of this class, the *Bowerbankia*, which the author has taken for general illustration, the digestive apparatus is very complex, consisting of a gizzard, with a stomach and intestinal apparatus. The *Flustræ* and *Escharæ* have also highly-developed digestive organs, though not so perfect as those of the animal just described. The *Bryozoa* are reproduced by the growth of germs of buds, and by ciliated gemmules capable of locomotion; they possess also a rudimentary muscular fibre. Nothing is said about their nervous system, though probably it exists; and with the exception of their superior digestive apparatus and slight muscular development, they do not greatly differ from the *Aceritous* Polyps, which, in outward form, they somewhat resemble. They are produced in the same way, namely, by gemmules external and internal, and, in this respect, are not so highly organized as some of the preceding class—the *Sterelmintha*.

Next in order come the *Rotifera* animals, which, although they resemble the *Animalcula Infusoria* in the kingdom *Acerita*, and were long confounded with them, have been lately discovered to possess a much higher structure. Their organs of locomotion are rows of cilia placed round the mouth, which, when in action, appear to revolve like wheels. They possess distinct muscular fibre, and a digestive apparatus provided with a pharynx, a gizzard of rather complex construction, and a stomach with no intestinal division; and they have also a rudimentary liver. Ehrenberg thinks that he has discovered a nervous system distributed through the body of these animals, as well as vascular apparatus, but the latter at all events seems to be doubtful. Their mode of respiration is probably by the introduction of water within the body to bathe the viscera, and their reproductive system is of a complex kind, though these animals are not diœcious; and their organization in this respect, therefore, though superior to the *Bryozoa*, must be considered inferior to the class *Cœlmintha*, and others we have already examined.

The *Epizoa* come next in order: animals which live parasitic on fishes, crustacea, etc., attaching themselves to the mouth, gills, branchiæ, or other exposed parts. These creatures, some of which are very singular in shape, and have strange rudimentary leg-like appendages, approximate in their higher types to the family of the Crustacea. They are diœcious, and their digestive apparatus is very simple, consisting of an œsophagus with a straight digestive canal, not divided into stomach and intestine. Their muscular system is more perfect than anything we have yet met with, and they possess two long filamentary nerves, which run beneath the alimentary canal. These animals also, it would seem, on their first exclusion from

the egg, are not fully organized, but they undergo several metamorphoses before assuming their perfect shape. No circulatory or respiratory system has as yet been discovered in them; and it is in this respect that, though forming a gradual transition to the articulated animals, their organization must be considered decidedly inferior.

We now come to the last tribe of the *Nematoneurose* division, the *Echinodermata*—animals of an exceedingly interesting structure, which approximate intimately, says Professor Jones, with the Polyps on the one hand, and the annulose animals on the other. The first tribe mentioned is that of the *Crinoidea*—animals which are attached to rocks by a pedicle or foot-stalk, and secrete a stony skeleton in all their parts. They are abundant in the fossil-world, but very rarely met with alive. Nothing is known more of their structure than that they possess a mouth and canal aperture, and we have only one minute species in our own seas.

The *Asteridæ* come next, and in their lowest structure resemble somewhat the last tribe of animals, only they are not fixed on a pedicle, but can move about at pleasure. Passing by the *Ophiura* to the true Star-fishes, we come to animals possessed of a central disc of a wonderful and beautiful construction, and a variable number of rays, into which, in the largest species part of the viscera extends. The mouth of these animals occupies the centre of the ventral surface, and, on the under side of each ray, we find immense numbers of tentacula or suckers, called ambulacra, arranged in parallel rows, which can be protruded at pleasure, and are used both for the purposes of locomotion and as instruments for the prehension of food.

The next type we meet with of this class, that of the *Echinidæ*, has no longer separate rays, though their form is still preserved in the flat or globose animals which this tribe includes. The *Holothuridæ* and *Fistularidæ* come next—animals which unite in a wonderful manner the hard spiny sea-urchins to the annulose or worm-like creatures of the great homogangliate class. The *Asteridæ* are highly-organized animals, having a coriaceous integument, with projections more or less spiny, and a hard calcareous skeleton composed of several hundred pieces. Their digestive apparatus consists of a muscular cesophagus, capable of great extension, and a stomach, with long cœcal appendages stretching into each ray, but no oral orifice. Their circulatory system is very complex, and permeates every part of the body. It is provided with numerous arterial vessels, and, according to Tiedemann, an organ equivalent in its operation to the functions of a heart.

The Star-Fishes also possess a curious organ, called by the same author a sand canal, which communicates at one end with a roundish calcareous mark, readily seen on the back of the animal, while with the other it

opens into a circular arterial tube that surrounds the mouth: the object of this organ is quite unknown, but it is used probably for the purposes of respiration. This latter function is likewise exercised by the admission of sea-water into the interior of the system, which bathes the entire inner surface of the viscera; and this is further carried out by the action of vibratile cilia, which are extensively distributed over the external and internal surfaces of the body. The organs of reproduction are of the simplest structure, there being no distinction of sex; and the nervous apparatus, which is filamentary and not ganglionic, is well defined. Ehrenberg thinks that he has discovered eyes in some species of Star-Fish, but apparently without good foundation. They can appreciate the most delicate touch, and have the power of casting off their rays when alarmed, which often sprout out again.

With regard to the *Echinidæ*, the outward shape of the common type is well known to all. It consists of a hard shell, composed of innumerable small plates (some of which are perforated) accurately joined together, and covered with spines and tubercles, which are used for locomotive purposes; and the whole external surface of this shell when alive is covered over with a thin vascular membrane. Through the perforated plates the animal can extend a great number of tubular feet or suckers, exactly analogous to those of the *Asteridæ*. The interior of the animal is most wonderful, the mouth is a simple orifice armed with jaws, which are worked by an elaborate set of muscles, and five sharp teeth. "These jaws," says the author, "from their great complexity and unique structure, form perhaps the most admirable masticating apparatus met with in the whole animal kingdom." They also possess an œsophagus and stomach, without intestinal division. Their circulatory system is very extensive, having a large intestinal vein with numerous arteries. Respiration is effected by the same means as that used by the Star-Fishes, namely, by the copious admission of the surrounding element into the interior of the body; and besides this, according to Delle Chiaje, they possess a series of tentacula in the neighbourhood of the mouth, which are capable of performing the office of *branchiæ*. Little is known about their nervous system, and, like the Star-Fishes, they have no distinction of sex.

The *Holothuridæ*, or Sea Cucumbers, are closely allied to this last family, but instead of a calcareous covering, they possess a dense fibrous cutis of considerable thickness, covered externally with a thin epidermic layer. Their muscular system is well developed, and, like the *Echini*, they possess suckers or feet, distributed either serially or all over the surface of the body, which they use as instruments of locomotion. Around their mouths is a circle of retractile tentacula, and the structure of their digestive apparatus is similar to that found in the *Echinus*, the teeth of which last mentioned

tribe are here represented by small calcareous pieces which surround the mouth. The respiratory apparatus of the *Holothuridæ* is remarkable, and differs from all other animals; like the *Asteridæ* and *Echini*, the sea-water is freely admitted into the interior of the body, but in this class instead of bathing the surfaces of the *viscera*, it is collected in a peculiar set of ramifying canals. The circulatory system of these animals is, like that of the *Echini*, but imperfectly understood, and various authors give different accounts of its arrangement. The generative system corresponds with that of the *Asteridæ*. The nervous apparatus is but obscurely developed, and the only sense the *Holothuridæ* possess is that of touch, by means of the tentacles placed round the mouth.

The *Fistularidæ*, the last of the class *Echinodermata*, are animals covered with a delicate cuticle or skin, with a strong muscular development beneath; like the last, they are furnished with tentacles round the mouth. The structure of the alimentary canal of this tribe corresponds with that of the *Holothuridæ*; the intestine is very long, and the anal orifice is situated high up in the body, an arrangement well adapted to the habits of the animal, (*Sipunculus*,) as, if placed in the usual position, the excrementitious food cast out, which consists of sand and broken shells, would soon fill the cavity occupied by the animal. The circulatory system is essentially analogous to that of the *Echinodermata*. Their nervous system is more complete than anything we have yet met with; and two small ganglionic masses can be detected; and as to their organs of reproduction, nothing decisive or satisfactory has yet been made out.

Uppingham, February 9th., 1857.

(To be Continued.)

ON THE DESTRUCTION OF BIRDS.

BY THOMAS FULLER, ESQ.

I AM very happy in seeing so valuable a contributor to "The Naturalist" as Mr. O. S. Round, joining in deprecation of the lamentable work of destruction now prevailing towards the feathered creation, through mere wantonness and superstition. All lovers of nature will unite in this feeling, whatever difference of opinion may exist upon the difficult question "How far their destruction is necessary?"

Mr. Round expresses his fears of undue increase if natural checks were removed. Are not these "natural checks" seriously interfered with in protection of game, by the destruction of every description of bird of prey, in which protection do not all the numerous small birds constituting the pilferers so annoying to the husbandman share? If undue increase detrimental

to cereal production exist, is it not very likely to arise from this cause? The indefatigable gamekeeper, with his unerring aim, has nearly exterminated all the larger birds of prey, and the smaller, such as Magpies, Jays, etc., are fast disappearing, whilst farmers wage war upon the remaining. Nearly every village has its Sparrow club, offering prizes for the largest number of heads; and we continually read of the hundreds produced at their meetings. Thus the removal of natural checks by one interest gives rise to unnatural remedies in the other, and the result is, extermination altogether.

Among natural checks Mr. Round rightly classes Cats; it is for this reason I denounce their undue increase by nurture and protection. If "poor pussy," so much caressed, could be readily domesticated to the useful purpose of a mouser in the house, it would be all very well; but the order *Felis*, to which she belongs, admits not of such control. Pretty and playful as the kitten is, maturity develops natural propensities, and pussy soon enlarges her sphere of action. The saucer of milk and prepared food do not satisfy the Cat; nor will she remain within to watch for mice; pussy soon betakes herself to the garden, steals stealthily round the borders, scratches and climbs the trees, basks in the sun, displays her attractions for others of her species, and hungry or not, is ever ready to pounce upon every denizen of the air; nests are rifled, and all the pretty songsters scared away. Thus are our suburban houses stripped of one of the greatest charms that can attach to a residence in a village or near a town.

Without entering upon the larger and difficult question, it may be interesting to inquire if it be not possible to at least lessen the grievance; and it appears to me the uses of our social economy supply reasons for doing so; in referring to which I hope no offence. The subject might be considered too trifling, but it really is mixed up with a great amount of pleasurable enjoyment, and forms one of the links in the chain of our terrestrial happiness. I would apologize for this explanation but from the feeling that all subjects in Natural History admit of greater latitude in discussion than other matters require. The physiological laws prevailing through animal life and the influence of certain organs in the modification of character are well understood, and enter practically largely into our social economy; by their application the greater part of our meat is rendered at all times nutritious, which would otherwise, at seasonal changes, be unfit for food. In like manner, many of the animals used for draught would be dangerous and unmanageable. Similar attention at an early period with the Cat, would prevent the savage development of the feline character, and improve its aptitude and sagacity as a mouser; and surely there can be no shock to humanity in subjecting playful kittens to the same process which the provident shepherd deals so extensively towards frisking lambs.

Equally important is the same preparatory step to the production of those majestic noble-looking animals which pace the park with lofty action, docile yet full of animation, champing their bits, yet easily reined in, and guided with fine touch of hand through crowds and throngs; while the fair and interesting occupants of the gay and elegant equipages recline in perfect ease and security, to the delight and gratification of the multitude of admiring spectators.

I have been induced to offer these remarks with the view of recommending the adoption of a practice which will obviously tend to prevent the undue increase of a class of animals which are now becoming, from their numbers, exceedingly annoying; and there is no doubt but one *Chat a l'Abelard* is, for all useful purposes as a mouser in a house, worth a dozen others. It is also deserving notice that this qualification, which produces such ultra-perfection in the operative singer, silences pussy altogether. He no longer breaks through windows, scales walls, scampers over roofs, wailing and screaming his love-ditties, making night hideous with unearthly sounds; but is to be found inside the house, quietly reposing on a mat, or watching with unwearied perseverance the mouse-holes.

Bath, January 17th., 1857.

A LIST OF THE BIRDS OF NOVA SCOTIA,
AS FAR AS ASCERTAINED, COMPILED MOSTLY FROM
ACTUAL OBSERVATION, IN THE YEARS 1852-3-4 AND 5.

BY LIEUT. BLAKISTON, OF THE ROYAL ARTILLERY; AND LIEUT. BLAND, OF
THE ROYAL ENGINEERS.

Those marked * are on the authority of Mr. Andrew Downs, a naturalist resident in the country.

WATER BIRDS.

American Coot, (*Fulica Americana*.)—Not common; depends on setting in of the frost: 1st. to end of November.

Yellow-breasted Rail, (*Rallus novboracensis*.)—Rare; depends on setting in of the frost: 1st. to end of November.

Sora Rail, (*R. Carolinus*.)—Not common; depends on setting in of the frost: 1st. to end of November.

American Bittern, (*Ardea lentiginosa*.)—Very common: leaves end of October.

* *Least Bittern*, (*Ardea exilis*.)—Accidental.

Great Blue Heron, (*A. Herodias*.)—Common: breeds.

Snowy Heron, (*A. candidissima*.)—Very rare.

Piping Plover, (*Charadrius melodus*.)—Rare.

American Ring Plover, (*C. semipalmatus*.)—Plenty: arrives in August; leaves in October.

Black-bellied Plover, (*C. helveticus*.)—Not common: arrives in August; leaves in October.

American Golden Plover, (*C. marmoratus*.)—Arrives in flocks about 15th. of August.

Turnstone, (*Streptilas interpres*.)—Not common.

Ash-coloured Sandpiper, † (*Tringa Islandica*.)—Abundant: August and September.

Red-backed Sandpiper, (*T. alpina*.)—Abundant: August and September.

Semi-palmated Sandpiper, (*T. semipalmata*.)—Abundant: August and September.

Little Sandpiper, (*T. pusilla*.)—Abundant: August and September.

Pectoral Sandpiper, (*T. pectoralis*.)—Rare.

Schinz's Sandpiper, (*T. Schinzii*.)—Not common.

Sanderling Sandpiper, (*T. arenaria*.)—Abundant: August and September.

* *Willet*, (*Totanus semipalmatus*.)—Very rare: breeds.

Spotted Tattler, (*T. macularius*.)—Common; arrives beginning of May: breeds.

Solitary Tattler, (*T. solitarius*.)—Common.

Yellow-shanks, (*T. flavipes*.)—Abundant: arrives beginning of July; leaves by end of August.

Tell-tale, (*T. vociferus*.)—Abundant: arrives later; leaves end of October.

Hudsonian Godwit, (*Limosa Hudsonica*.)—Common: arrives about 15th. September; leaves end of October.

Curlew Sandpiper, (*Tringa subarquata*.)—Not common.

American Snipe, (*Scolopax Wilsonii*.)—Common: arrives end of March, or early in April; leaves middle of October. A few breed here.

Red-breasted Snipe, (*S. novoboracensis*.)—Common: August and September.

American Woodcock, (*Microptera Americana*.)—Common: arrives about 17th. March; leaves about the end of October. Breeds here.

Hudsonian Curlew, (*Numenius Hudsonicus*.)—Common: August and September.

* *Long-billed Curlew*, (*N. longirostris*.)—Very rare.

Esquimaux Curlew, (*N. borealis*.)—Not common.

Grey Phalarope, (*Phalaropus Wilsonii*.)—Rare.

Canada Goose, (*Anser Canadensis*.)—Passes north 17th. March; returns 15th. October.

* *Brent Goose*, (*A. bernicla*.)—Rare.

* *Snow Goose*, (*A. hyperboreus*.)—Occasional.

† The Plovers and Sandpipers leave from the middle to end of October, or before the frost.

- Mallard Duck*, (A. boschas.)—Rare.
- Dusky Duck*, (A. obscura.)—Abundant: breeds; resident.
- Gadwall*, (A. strepera.)—In winter: rare.
- Pin-tail Duck*, (A. acuta.)—In winter: common; breeds north.
- American Wigeon*, (A. Americana.)—Not common: winter.
- Summer Duck*, (A. sponsa.)—Arrives about middle of March: breeds; rare.
- American Green-winged Teal*, (A. Carolinensis.)—Common: leaves about middle of October.
- European Green-winged Teal*, (A. crecca.)—One killed here in September, 1854.
- Blue-winged Teal*, (A. discors.)—Not common; here in September: breeds north.
- * *Shoveler Duck*, (A. clypeata.)—Very rare: breeds north.
- Scaup Duck*, (Fuligula marila.)—Autumn and spring: not common.
- Ring-necked Duck*, (F. ruftorques.)—Rare: breeds on lakes inland.
- Ruddy Duck*, (F. rubida.)—Very rare.
- * *Pied Duck*, (F. Labrador.)—Occasional.
- Velvet Scoter*, (F. fusca.)—Common; goes north to breed: here in winter.
- Surf Scoter*, (F. perspicillata.)—Not very common: breeds north as well as inland.
- American Scoter*, (F. Americana.)—Abundant: breeds north.
- Eider Duck*, (F. mollissima.)—Abundant in winter: breeds north.
- Golden-eye Duck*, (F. clangula.)—Abundant in winter.
- Buffel-headed Duck*, (F. albeola.)—Common: breeds north.
- Long-tailed Duck*, (F. glacialis.)—Abundant in winter.
- Harlequin Duck*, (F. histrionica.)—Common in winter.
- * *King-Eider Duck*, (F. spectabilis.)—Has been seen here: very rare.
- Goosander*, (Mergus merganser.)—Common; resident: breeds on the lakes.
- Red-breasted Merganser*, (M. serrator.)—Common; resident: breeds on the lakes.
- Hooded Merganser*, (M. cucullatus.)—Very rare.
- Common Gannet*, (Sula bassana.)—Common off the coast.
- Common Tern*, (Sterna hirundo.)—Abundant: breeds here.
- Bonaparte's Gull*, (Larus Bonapartii.)—Not uncommon in autumn.
- Black-headed Gull*, (L. atricilla.)—Rather rare.
- Kittiwake Gull*, (L. tridactylus.)—Very common.
- * *Common American Gull*, (L. zonorhynchus.)
- Herring Gull*, (L. argentatus.)—Common.
- Black-backed Gull*, (L. marinus.)—Common: breeds in Labrador.
- Mother Cary's Chicken*, (Thalassidroma pelagica.)—Common off the coast.
- Least Petrel*, (T. Wilsonii.)

- Common Puffin*, (Mormon arctica.)
Little Auk, (Mergulus alle.)
Razor-bill, (Alca torda.)
Common Guillemot, (Uria troile.)
White-winged Guillemot, (U. grylle.)
Great Northern Diver, (Colymbus glacialis.)—Common: resident.
 * *Red-throated Diver*, (C. septentrionalis.)—Very rare.
Red-necked Grebe, (Podiceps rubricollis.)—Common in winter.
Pied-billed Grebe, (P. Carolinensis.)—Very rare here.
 * *Cormorant*, (Phalacrocorax carbo.)
 * *Wandering Shearwater*, (Puffinus cinereus.)
American Oyster-catcher, (Hœmatopus palliatus.)—Has been seen here.
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THE VEGETABLE CATERPILLAR FROM NEW ZEALAND.

BY W. V. GUISE, ESQ., F. G. S.

HAVING lately had opportunities of observing several specimens of the strange Fungus-bearing Caterpillars of New Zealand, one of which is now in my possession, I have been induced to make some inquiries into the subject, and have much pleasure in supplying the following notices—being all that I have succeeded in collecting—in hopes that others among your numerous readers, may be able to furnish further information concerning these remarkable and most singular insect phenomena.

By far the most complete account which I have been able to meet with, I find in the late Mrs. Hussey's exquisite work on the British Fungi, entitled "Illustrations of British Mycology." From that work I extract the following passages:—

"The Caterpillar with a *Sphaeria* growing from it, is the larva of *Hepialus virescens* of Doubleday, found in New Zealand; it is as large as those of our largest *Sphinxes*: all colour has vanished, but the contour remains perfect. From the head proceeds a rigid contorted stem, six or seven inches long, like a dry twig, or very solid herbaceous flower-stem; the upper portion for about one-third of its length, is closely beset with minute spheres, many broken open and containing dust-like bodies.

When first we examined this curious object, thinking of Tartarian lambs and similar ingenious fabrications, we shrewdly suspected that in his native paradise of ferns, a cunning New Zealander had trimmed the rhizoma of some creeping fern into this Caterpillar, and that the fructification was analogous to that of the Adder's tongue; but being assured on competent authority that a powerful microscope developed *asci* and *sporidia* in the capsules, which consequently were true *Sphaerias*—that we had in England

both a Caterpillar bearing a *Sphaeria*, (*militaris*,) and a chrysalis producing a *Sphaeria* (*entomorphiza*,) about which no question had ever been raised, and five specimens of both had been found by Mr. Berkeley in person—it only remained to admire in acquiescing wonder one more of the many marvels of creation.”

The following valuable information was transmitted by Dr. Joseph Hooker, of H. M. Discovery-Ship, “Erebus:”—

“About *Sphaeria Robertsii* I collected all the information and as many specimens as I could, but still am much at a loss to account for its development. They are found in spring, generally under tree-ferns; the Caterpillar is buried in the ground, as is the lower portion of the fungus. Now both these fungi, (*i.e.* this and the following species, *Sphaeria Taylori*, an analogous Australian species,) belong to Caterpillars which bury themselves for the purpose of undergoing their metamorphosis; and both Mr. Taylor and Mr. Colenso hold the same opinion, that in the act of working the soil, the spores of the fungus are lodged in the first joint of the neck, and the Caterpillar settles head upwards to undergo its change, when the vegetable develops itself. I do not remember whether you have remarked in your ‘Icones,’ that the entire body of the insect is filled with a pith, or corky vegetable substance, and that the intestines are displaced, which my specimens in spirits shew well; and then what does the muscular fibre of the animal become? It must, I suppose, be all turned into vegetable, for the skin of the creature remains quite sound all this time.

This change may take place from the displacement of one gas and development of another; it also occurs in the dark, and is hence somewhat analogous to the formation of fungi on timber-work in mines. However this may be, the whole insect seems entirely metamorphosed into vegetable, with the exception of the skin and intestines.”

Professor Balfour in his “Manual of Botany,” says:—

“Some fungi are produced on living animals. Thus the disease called muscardine in the silkworm, is produced by *Botrytis Bassiana*. Certain wasps in the West Indies are affected by a similar disease. *Sphaeria sinensis*, a celebrated Chinese drug, grows from a Caterpillar. *Sphaeria Robertsii* is developed on the larva of *Hepialus virescens* in New Zealand; and *Sphaeria Taylori* on an Australian Caterpillar. So are also *Sphaeria sobolifera*, *entomorphiza*, *militaris*, and others.”

One word more upon the *position* assigned by your correspondent, Mr. Havers, to the fungus, which he has represented as proceeding from the tail of the Caterpillar, whereas, in all the examples which have come under my observation, the fungoid excrescence has invariably been developed upon the opposite extremity of the body. It is of course quite possible that your correspondent is not in error upon that point, but it

strikes me as appearing anomalous, and certainly not in accordance with the opinions respecting the origin of the fungus recorded above by Dr. Hooker.

Elmore Court, February 7th. 1857.

AN ENTOMOLOGICAL DREAM.

ON butterflies, larvæ, and moths intent,
One bright and cheerful morning I went,
Well supplied with boxes, to where there
stood

In leafy majesty a mighty wood.
I thrashed all the trees, the net I whirled,
And opened every leaf I saw curled,
Till, weary, I laid me down by a stream,
And, with sleep overcome, I dream'd a dream.

One by one; there passed before me in state
All our Entomologists, small and great;
Their characters, thoughts, and works were
laid bare,

All of which I noted down with great care.
Then, methought, a voice whispered soft
and low,

The results of this dream the world must
know.

Then hearken, my readers, male and female,
To the strange details of this dream-born
tale.

First appear'd *Scolioformis* A.....h,
Agrotis in hand. Alas! what a dearth
Of names there must be, when, day after day,
We find moths green, brown, black, orange,
and grey

Call'd *Douglasii*, *Staintoni*, and many more,
In proof how small is our classical lore!

Warringtonellus's a very long name,
But it does n't add much to the author's fame.

However, I cannot pause here to show
That in giving new names we're far too slow,
For a pleasant writer now calls on me
To give forth his name, to wit, C. R. B..e.

His notes are writ in agreeable style,
And oftentimes lessen one's angry bile;

For *Rhamni* he pleads with persuasive pen,
And presses his plea once, twice, and again;

Then closing his desk, he seizes his net,
And let it be fair, or let it be wet,

He goes forth to catch some innocent flies,
Which may gladden his own or others' eyes,

The butterfly-net so deftly he flings,
That thus he has captured many good things—
Iris, *Alni*, and *C. obliquaria*,
But his *fame* rests on *Conspicuarina*.

And now, obeying a general call,
Came E. C. B...n, of Daresbury Hall.

Ah! Mr. B, take a warning from me,
And don't buy *Lathonia* or *Daptidice*;

Honest dealers are just as scarce as they,
And, like them, you can't find 'em every day.

But I will not dwell on this subject here,
Having more to say, as will soon appear;

For it must be told, with shame and dismay,
That this pageant did not vanish away

Till certain shades had passed in review,
Of whom fame tells a story sad, but true.

After this I heard an argument hot,
"Has *N. camelina* two broods or not?"

"Most surely she has," says H. H....r
C...e,

"A fact which I thought ev'ry tyro knew;
I had eggs in May, in August they spun,

And in September came forth number one.
What more can you ask to prove I am right?

The matter is settled as clear as light."
"Pooh!" says E. S., "you know nothing

about it,
And we Londoners, all of us, scout it.

Unmoved by the sneers of this first-rate hand,
Whose experience scarce goes beyond the

Strand,
Our valiant C...e dons his armour again,

And tells us the how, the where, and the
when;

Such clear facts he brings, and so well
expressed,

That, "quoad the *rustics*," the war's at rest.
Then give all the honour where it is due,

To that staunch "Camelinist," H. H. C...e.
J. C....s next claimed my notice and

praise;
For, though he's a light of earlier days,

His love is not quenched, but burns as clear
As when he had numbered but twenty years;
With regret I've heard that his eyesight's weak,
And that he no more can an insect seek;
Sincerely I hope that it is not so,
But that he may soon be able to show
That the eye's not dimm'd, nor the hand
grown cold,

But that he's the same as in days of old,
When, with careful eye and with skilful hand,
He adorned the work which his mind had
plann'd

With those life-like figures which, all agree,
We scarce ever again can hope to see.
But now a great name appeared on the stage,
Name second to none of the present age,
Discoverer of sugar, that tempting bait,
Which beguiles the *Noctua* small and great;
As breeder of larvæ he holds first place,
His insects he sets with peculiar grace,
And many, I think, will be of my mind,
That a finer collection none can find.
Yet unassuming and modest withal,
He imparts his knowledge to great and small,
And, unlike some whom 'twere easy to name,
Of far more pretension, but far less fame,
With generous hand his insects he sends
To all his entomological friends;
He asks not, he seeks not, aught in return,
For kindlier feelings within him burn,
And well I know that I shan't stand alone
When, with thankful lips, I gratefully own
That many and many an insect fair,
Which adorns my drawers, had never been
there

Excepting for him whose praises I sing,
Though with feeble pen and on humble wing.
From what has been said, I think we all may
Perceive that I mean my friend D.....y,
And so let us give him three hearty cheers,
And wish him long life and good insect years.
The lovers of Nature and Nature's works,
And those who would learn where an insect
lurks,

In the next who pass'd by will surely find
A clever author, and one of like mind.
The house, the garden, the orchard, the field,
Whatever the hedges and lanes do yield,
The fences, the heaths, the commons, the
downs,

The woods and the waters, (where are the
towns?)

The mountains, the shore, are all in his
book,

Which well deserves something more than a
look.

Had you compiled less, and given us more
In *your own* pleasant style, of insect lore,
Know, Mr. D.....s, that others, like me,
Would have thought your work of faults
almost free.

But let us not carp, let us rather ask
Could I have done better, were *mine* the task?
Now next came the Reverend J.....h G.....e,
Who, trowel in hand, may often be seen.
His pen he can use to tell us the way
To capture a moth on each winter's day.
So closely he digs, that many would dub
The digger himself as nought but a grub.
To see him thus dig, his hands thus employ,
Is cause of wonder to man and to boy.
Then methought I heard the mournful lament
Of him who goes forth on digging intent:
"It's very hard work, not to mention the
cold,

There's much disappointment in damp and
mould;

My poor hands are scratch'd, my back is
pain'd,

And yet for all this no pupa I've gained;
To return empty-handed, tired, and sore,
Is too much, so I'll not try any more."
But stay! what is this? an earthen cocoon!
Which soon makes him change his querulous
tune;

And then he exclaims, as others appear,
"I'll try pupa-digging again next year!"
But whom have we now? a widely-known G.,
G.....n, to wit, as my readers may see;
He dwells far away in a northern town,
And will tell you with hot and angry frown,
"All the *best* insects, including the '*Ors*,'
Were taken by *me*, or my ancestors!"
O! make let us weave a garland of bays
For these wonderful "lights of other days;"
And when we're gone, may a G.....n arise
To celebrate *us* for catching *some* flies!
The next who pass'd was one learn'd and
urbane,

One of whom Ireland may justly be vain;
In anatomical knowledge there's none
Who more or better-earned laurels has won.
But his fame's not confin'd to Erin's land,
Where he heads a small but zealous band,
And H.....'s name stands just as high
here,

For knowledge profound, and for judgment
clear.

(To be continued.)

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 90.)

Mustela *Boccamela*, *Bechst. Bonap. Schinz.*

Mustela fusca, *Bachm. Schinz.*

Mustela vulgaris, *Schinz. M. nivalis*, *Linn. Schreb. Desm. Cuv.*

Mustela altaica, *Pallas. Schinz.*

Mustela leucogenis, *Schinz. M. javanica*, *Seba.*

Mustela africana, *Desm. Geoff. F. Cuv. Schinz.*

Mustela Cuja, *Pöppig. Schinz.*

Mustela Quiqui, *Schinz.*

Mustela brasiliensis, *Schinz.*

Mustela lutreola, *Linn. Schreb. Cuv. Desm. Schinz. Viverra lutreola*, *Pallas. Lutra lutreola*, *Shaw. L. minor*, *Erxl.*

Mustela melampus, *Temm. Schinz.*

Mustela brachyura, *Temm. Schinz.*

Mustela Itatsi, *Temm. Schinz.*

Mustela Henrici, *Schinz.*

Mustela xanthogenys, *Gray. Schinz. M. brasiliensis*, *Schinz. M. javanica*, *Seba. Fisch. M. Ermineæ*, *Pallas.*

GULO.

Gulo borealis, *Nill. Schinz. G. arcticus*, *Desm. Schreb. G. luscus*, *Sab. Penn. Ursus Gulo*, *Linn. Ursus luscus*, *Linn. Meles Gulo* *Pal.*

LUTRA.

Lutra vulgaris, *Schreb. Schinz. Mustela lutra*, *Linn. Viverra lutra*, *Pall.*

Lutra roensis, *Ogyl. Schinz.*

Lutra nudipes, *Mel. Schinz.*

Lutra poensis, *Water. Schinz.*

Lutra Canadensis, *Sab. Cuv. Isid Geoff. Schreb. Rich. Schinz. L. Brasiliense*, *Harl.*

Lutra lataxina, *F. Cuv. Isid Geoff. Fisch. Schinz.*

Lutra insularis, *Cuv. Isid Geoff. Fisch. Schinz.*

Lutra enydri, *F. Cuv. Isid Geoff. Fisch. Schinz.*

Lutra Barang, *Raffl. Schinz. L. leptonyx*, *Wag.*

Lutra Simung, *Horsf. Schinz.*

Lutra maculicollis, *Licht. Schinz.*

Lutra Chilensis, *Benn. Schinz.*

Lutra Paranensis, *Rengg. Schinz.*

Lutra platensis, *Water. Schinz.*

Lutra Brasiliensis, *F. Cuv. Schinz.*

Lutra Nair, *F. Cuv. Isid Geoff. Schinz. L. Indica*, *Gray? Nir-Nair Indorum*, *Fisch.*

Lutra Kutab, *Schinz.*

Lutra taranyensis, *Hodg. Schinz.*

Lutra monticola, *Hodg. Schinz.*

Lutra indigitata, *Hodg. Schinz.*

Lutra aurobrunea, *Hodg. Schinz.*

Lutra felina, *Schinz.*

Lutra inunguis, *F. Cuv. Schinz. L. capensis*, *Cuv.*

Lutra solitaria, *Natt. Schinz.*

PTERURA.

Pterura Sambachii, *Weigm. Schinz.*

Pteronura Sambachii, *Gray.*

ENHYDRIS.

Enhydri *marina*, *Flem. Licht. Schinz.*

E. Stelleri, *Fisch. Lutra marina*, *Stell. Mustela Lutris*, *Linn. Schreb.*

Phoca Lutris, *Pall.*

URVA.

Urva cancrivora, *Hodg. Schinz. Gulo*

Urva, *Hodg.*

BASSARIS.

Bassar *astuta*, *Licht. Darst. Wägl. Schreb. Schinz.*

(To be continued.)

ON BIRDS USING OIL FROM GLANDS.

TO THE EDITOR OF "THE NATURALIST."

SEEING my friend Mr. Waterton's name mentioned in "The Naturalist," I the other day left the number with him for perusal, and to-day received the following, which I think it is but fair to him to publish in the same medium in which Mr. Fuller has made his observations.—R. HOBSON, Leeds, March 12th., 1857.

"I thank you for the loan of "The Naturalist," which I do not take in. Will Mr. Fuller deign to satisfy me by stating positively that he has seen with his own eyes the 'oily matter' from the gland of birds upon the plumage of these said birds. I hold that all 'oily matter' is injurious to the nature of feathers. I have never been able to detect the slightest appearance of 'oily matter' on the plumage of the many birds (say five thousand) which have passed under my dissecting-knife. Mr. Fuller states that my remark concerning 'a painful operation, etc.,' 'is all nonsense.' Will he obligingly say under what form of condemnatory words he would wish me to notice his own remark, namely, 'that it is known that the bones of swimming birds are not hollow, like those of other classes, but filled with oily matter.' What says the learned ornithologist to the Wild Duck, a swimming bird, having the principal bone in both of its wings always hollow?—CHARLES WATERTON, Walton Hall, March 12th., 1857."

In any reply to this, I hope Mr. Fuller will be as brief as possible, and the more so inasmuch as the arguments against the supposed use of the oil gland have been overturned in the "Zoologist," page 751, etc., in an article which, though considerably marred by flattery, is conclusive, so far as the said arguments are concerned.—F. O. MORRIS.

Miscellaneous Notices.

Curious freak of a Dog.—The clergyman of this place has in his possession a pointer, which, to prevent following him to church a few Sundays ago, was ordered to be confined in the coach-house, but not liking her confinement, she took advantage of escaping up the chimney, on the top of which, to the clergyman's great surprise, she was standing when he left his home to do his afternoon duty, the time for which was so close at hand that he could not stay to see how the dog had attained her elevated position, or how she would descend from it. On returning, and making an examination, he found that she had ascended the flue as a chimney-sweep, jumping from the top of the chimney to the thatched roof, from thence to the road which passes behind the house on a level with the eaves of the house, having a passage of about five feet between the two; thus making her

descent in safety; since that time she has frequently accomplished the same feat. I saw her do it last week in less than two minutes. The chimney is nearly twenty-five feet in height, the lower two-thirds built of the common clay-slate of the neighbourhood, the upper third of bricks; the flue measures below twenty-seven inches by eighteen, gradually decreasing to the brick-work, where, as well as I can judge from below, it is eighteen inches square to the top.—STEPHEN CLOGG, Looe, March 2nd., 1857.

Long-eared Owl.—I had a fine specimen of the Long-eared Owl sent me in the early part of January, shot on Braddock Moor by the gamekeeper of the Hon. G. M. Forteseue, of Boconnoe, who also shot, a few days after, what he calls a very large Kite. I have not been able to get any description of the bird, but suppose it to be the Moor Buzzard.—Idem.

The Raven.—I was gratified on old Christmas Day by seeing a flight of no less than sixteen Ravens—a sight rarely seen in this part of Cornwall now-a-days.—Idem.

Indications of Spring.—There are many indications of the coming of spring to be daily seen in this locality;—snowdrops are already past their prime, whilst in many sheltered sunny nooks may be seen clusters of beautiful primroses, and here and there the bright golden buttercup. More than a week since I saw a very fine specimen of the Sulphur Butterfly, and yesterday, in little more than one hour's walk, I numbered no less than fifteen of those insects, (all males,) with one Tortoiseshell and two Peacock Butterflies sporting about with all the graceful and buoyant ease of that beautiful tribe of insects. Spring also begins to influence the feathered tribes;—Heron are to be seen repairing their nests, preparatory to incubation, and on Saturday last I observed a Wren busily occupied in building operations; whilst the songs of our native warblers and songsters are to be heard on every side, filling our ears with melody, and forming a concert not to be equalled in our finest cities.—Idem.

White-tailed Eagle.—In January last there was a fine specimen of the White-tailed Eagle shot by two labourers in the parish of East Quantockhead, near Bridgewater. It is now at Mrs. 'Turles', bird-stuffer, of this town, who has shewn her well-known talent in preserving it, who, I consider, second to none in that art.—J. MELHUISE, Taunton, February 23rd., 1857.

Rare Birds.—On the 20th. of last November I had a very good male specimen of the Little Auk, (*Uria alle*,) from Welney Wash; on the 21st., a beautiful male Grey Shrike, (*Lanius excubitor*;) December 2nd., I shot a male Chiff Chaff, (*Sylvia rufa*,) at Batesbite, now in the collection of A. F. Sealy, Esq. Dec. 6th., two Snow Buntings from Ely, and two from

Haddenham, (two males and two females,) and a very fine Merlin, (*Falco aesalon*.)—WILLIAM FARREN, JUN.

Rare Birds about Plymouth.—In October last a fine specimen of the Solitary or Great Snipe, (*Scolopax major*,) was caught a few miles from Plymouth. In November a few examples of the Black Redstart were killed. In December the Little Auk, Fork-tailed Petrel, and three Bitterns were obtained.—JOHN GATCOMBE, Wyndham Place, Plymouth, March 7th., 1857.

The Jack Snipe.—These birds, as is well known, lie very close, and no doubt many a one is passed by unsuspected, as the two following instances will shew:—One of my boys, when out shooting this winter, came within a yard of one before he saw it, and he had to go back some way before he could shoot it. Near the same place, a couple of months afterwards, a tenant struck one with his whip as it lay on the ground close to him.—F. O. MORRIS, March 13th., 1857.

TO THE EDITOR OF "THE NATURALIST."

I am indebted to the kindness of J. Gwyn Jeffreys, Esq., for permission to send to your periodical the following extract from a letter, the result of an examination kindly undertaken by him of the small *Skenea* found by me at Falmouth, which I at first considered a new species, (a short account of which appeared in "The Naturalist" a few months ago,) and a careful comparison of it with a specimen taken by himself in the Mediterranean, and also a series of the ordinary form of *Skenea rota*, taken by me in a living state at the Land's End, and other parts of the Cornish coast:—"The result of a careful comparison of these specimens induces me to retain the opinion I at first formed, that your *Skenea tricurvata* is only a variety of *S. rota*; your species appears to differ from *S. rota* in its somewhat smaller size, in the whorls being flatter and more angular, (the latter character being probably attributable to the greater prominence and distinctness of the ridges,) and in the transverse ribs being less marked, and not so nodulose as in the typical form. My specimens from the Mediterranean belong to this variety. All the specimens have three spiral ridges, one of them encircling the periphery, and forming an obtuse keel, another on the upper side, and a third on the lower side in the centre of each whorl. The ridges are nearly equidistant from each other, and their direction is marked by a fulvous band; this character has not, I believe, been observed by any one except yourself. I however give this opinion with some reservation, as I should have preferred to have had an opportunity of comparing your specimens with others which I have taken myself from various parts of the British and Irish coasts; this, unfortunately, I cannot do at present while I am divorced from my cabinets."—W. WEBSTER, Upton Hall, Birkenhead, February 9th., 1857.

I have been a subscriber from the first to "The Natural History Review" and have been pleased with the almost invariable impartiality of their comments. I am, however, quite of your opinion as to their Review in July last of your "British Butterflies," as explained by you at page 35 of vol. vii. of this work. I agree with you that the "discursive paragraphs" and "religious remarks," complained of by them, have, with the general accuracy of the work, tended much to its popularity and success. I have before written to ask you to publish a volume on a like plan upon "Moths," etc., and trust yet to see you comply with the request.—
JOHN GARLAND, Dorchester, February 7th., 1857.

Review.

The Natural History Review. No. IX. Published quarterly, price 2s. 6d.
London: HIGHLEY, Fleet Street. Edinburgh: JOHNSTONE AND HUNTER.
Dublin: HODGES AND SMITH.

THE following are the contents of the above part of this Review:—

Review 1.—"Untersushungen ueber die Fluegel-typen der Coleopteren." Von Prof. Dr. H. Burmeister. Part 1.—Clavicornia, with a plate. 2.—"Glaucus, or the Wonders of the Shore." By the Rev. Charles Kingsley. 3.—"The Natural History of the Tineina." By H. T. Stainton. 4.—"The Fern Allies." By John E. Sowerby. 5.—"Entomologist's Annual for 1856." 6.—"Geology, its Facts and Fictions." By W. Elfe Taylor. 7.—"Experiments on the Dyeing Properties of Lichens." By W. L. Lindsay. 8.—"The Flowering Plants and Ferns of Great Britain." By J. G. Baker.

ORIGINAL COMMUNICATIONS MADE TO VARIOUS SOCIETIES.

I.—"Address to the Dublin University Zoological Association." By the President, R. Ball, L.L.D., M.R.I.A., etc.

II.—"On the Affinities of the Aphaniptera among Insects." By A. H. Haliday, A.M., M.R.I.A., V.P. Dublin University Zoological Association.

III.—"On some Rare Fresh-water Mollusca." By E. Waller.

IV.—"Notes on the Larva of *Octhebius punctatus* and *Diglossa mersa*." By A. H. Haliday, A.M., M.R.I.A.

NOTICES OF SERIALS.

I.—"The Annals and Magazine of Natural History" for October, November, and December, 1855.

II.—"Quarterly Journal of Microscopical Science" for October, 1855.

III.—"The Zoologist" for October, November, and December, 1855.

IV.—"Hooker's Journal of Botany and Kew Garden Miscellany" for October, November, and December, 1855.

V.—"The Naturalist" for October, November, and December, 1855.

And notices of the Serials of North America, Russia, Sweden, Germany, Switzerland, Holland, Belgium, France, Italy, and Prussia.

PROCEEDINGS OF SOCIETIES.

Dublin University Zoological Association for November 16th., 1855; with a plate, illustrative of a paper to appear in the April number, "On a Lepidopterous larva attacking the horns of the *Orea canna* and *Kolus hysyprinnus*."

In my notice of the previous part of this work, in my criticism of the review of my "History of British Butterflies," I omitted to remark one matter touched on by the reviewer, namely, his observation on the mistake as to the extent of the wings of the *Gonepteryx Rhamni*, speaking of which he characterizes it as "odd" that Mr. Westwood should have made the mistake twice, but as "truly surprising" that I, following him, should have made it once. This strikes me as scarcely fair.

The Querist.

Vegetable Caterpillar from New Zealand.—Under this title a very imperfect description is given of the growth of a fungus upon a living body. The fungus is known by the name of *Sphaeria*. There are several species, of which the following may be mentioned:—*Sphaeria sinensis*, a highly-valued Chinese drug, which consists of a caterpillar or larva of a Lepidopterous insect, probably a species of *Agrotis*, from the neck of which projects the fungus designated as *Sphaeria sinensis*. For a fuller account of this fungus, and a figure of it, refer to "Pereira's Materia Medica," vol. ii., part 1, page 948. *Sphaeria Taylora* grows on an Australian caterpillar. I have two or three specimens of this fungus, given to me by W. H. Brereton, Esq., who obtained them in Australia. *Sphaeria Robertsii*, developed on the caterpillar or larva of *Hepialus virescens* in New Zealand. This is probably the species referred to by Mr. Arthur Havers. For a figure of it, refer to "Balfour's Class Book of Botany," part i., page 345, also part ii., page 963. The growth of the fungus destroys the Caterpillar.—R. WILBRAHAM FALCONER, M.D., Bath.

Vegetable Caterpillar.—Observing Mr. Havers' query relative to the Bullrush or Vegetable Caterpillar in the last number of the "Naturalist," and having in my possession a very fine specimen, together with a descriptive account of the insect or plant, I send you a transcript for the information of your correspondent:—" *Sphaeria Robertsii*. Native name *Aweto* or *Hotito*. Bullrush Caterpillar—The *Aweto* is only found at the foot of one particular tree, the *Rata*. The root of the plant, which in every instance exactly fills the body of the Caterpillar, in the finest specimens attains a length

of three and a half inches, and the stem which germinates from this metamorphosed body of the Caterpillar is from six to ten inches high; its apex, when in a state of fructification, resembles the Club-headed Bullrush in miniature, and when examined with a powerful glass, presents the appearance of an ovary. There are no leaves; a solitary stem generally comprises the entire plant, but if any accident break it off, a second stem arises from the same spot. The body is not only always found buried, but the greater portion of the stalk as well, the seed-vessel alone being above ground. When the plant has attained its maturity (three years) it soon dies away. When newly dug up, the substance of the Caterpillar is soft; and when divided longitudinally, the intestinal canal is distinctly seen. Most specimens have the legs entire, with the horny part of the head, mandibles, and claws. The vegetating process, it is conjectured, arises prior to the insect's metamorphosis, from some seeds of the fungus getting between its scales, which invariably causes its death.—WILLIAM WELLS, Plymouth, 27th. February, 1857.

The Vegetable Caterpillar.—This is described in "Gray's Supplement to the Pharmacopœia" as the larva of *Hepialus virescens*, a native Moth of New Zealand, and is found only at the root of the Rata tree, (*Metrosiderus robusta*), a myrtaceous plant. The fungus *Sphæria Robertsii* is found growing on the larva. I have a specimen of one which was sent to me from New Zealand. Although it is very much shrunken, there is no doubt of its having been a Caterpillar; its inside is completely filled with the fungus, and from its tail has grown two stems, one of them five inches long; about an inch of the top is covered with a fungus bark, which gives it the appearance of a Rat's tail. I am inclined to think that the Caterpillar is attacked by the parasite fungus, which spreads till it finally destroys life; and then taking a firmer root in the earth, becomes an independent fungus in the natural order of creation.—SIDNEY STYLE, Brighton.

Vegetable Caterpillar from New Zealand.—This so-called Vegetable Caterpillar is the larva *Hepialus virescens* attacked by a curious fungus common in New Zealand—the *Sphæria Robertsii*. The growth of the fungus destroys the Caterpillar.—F. M. BURTON, Uppingham.

Method of making Snow and Ice for Cases of Stuffed Birds.—In reply to the query of Mr. Braim, the following recipe will be found to answer the purpose:—Put a quarter of a pound of powdered alum to about a pint of warm water, and leave it till dissolved; then immerse your grasses, etc., and leave them till cold, when the crystals will have formed. The strength of the solution must be varied according to the size of the grasses, etc., used: but one or two trials will shew this.—Idem.



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"A History of the Nests and Eggs of British Birds."

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O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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ON THE CLASSIFICATION OF THE ANIMAL KINGDOM, BY THE DISTRIBUTION OF THE NERVES.

BY F. M. BURTON, ESQ.

(Continued from page 101.)

No. III.



WE have now come to the conclusion of the second great division of the Animal Kingdom, and have seen how the various orders and tribes gradually increase in organic development towards the great world of *Articulata*, each development being indicated by a similar increase of the nervous system in a manner that needs no comment; and we now proceed to examine the Homogangliate division, in which we find five great families—*Annelida*, *Myriapoda*, *Insecta*, *Arachnida*, and *Crustacea*.

Hitherto we have had to do with animals fitted only to exist in water, or substance of a fluid nature; but in the class we are now entering upon, we shall find animals capable, from their advanced state of organization, to subsist on land. The principal external character of this division, says Professor Jones, is that “they are all of them composed of a succession of rings, formed by the skin or outward integument, which, from its hardness, constitutes a kind of external skeleton, supporting the body and giving insertion to the muscles provided for the movements of the animals.” In the first class, the *Annelidans*, these rings are very numerous, and the outer covering is of a soft nature. In the *Myriapoda* the rings become less frequent, and the body harder. In the *Insects* there is a greater concentration of the external skeleton; and still more so in the *Arachnidans* and *Crustaceans*. We shall also find, and this is an important fact never to be lost sight of, that in proportion as the various tribes comprising this division become more condensed in their structure, so much is their nervous system developed; the long many-ringed *Annelidans* requiring, in fact, a distribution of ganglia to guide their different segments, while it is as obviously necessary for the higher orders that their nervous system should be concentrated.

And first as regards the *Annelidans*. The blood of these creatures, says Professor Jones, “is remarkable for its red colour, and circulates in a double system of arteries and veins; they are moreover almost all hermaphrodite.” Cuvier has separated them into three distinct orders, the *Abranchia*, *Dorsibranchia*, and *Tubicola*. The animals belonging to the first order have no external respiratory apparatus, such as the common leech and earth-worms. The former, *Hirudo medicinalis*, is a soft slippery animal, possessed of considerable muscular power, but without external limbs. It moves about by means of flat discs at each extremity, which act as suckers; near the centre of the anterior one is situated the mouth, which is armed

with three small cartilaginous teeth. Its digestive apparatus consists of a stomach, with numerous lateral cœcal appendages, capable of great distension, and a small intestine. It breathes by means of spiracles, of which there are seventeen on each side. The circulatory system is of a complex nature, and is provided with veins and arteries, but there is no heart; while the nervous system is composed of a series of small ganglia connected by filaments, the anterior pair being larger than the rest, forming a rudimentary type of the brain of vertebrate animals. They are possessed of eight or ten simple eyes, and as regards their generative organs, they are hermaphrodite, but not self-impregnating.

The *Abranchia terricola*, or Earth-worms, live beneath the ground, either inland or amongst the mud by the sea-shore. They move along by means of a number of sharp spines. Their digestive apparatus consists of a straight and capacious alimentary canal, with an œsophagus and gizzard. Their circulatory system is somewhat similar to that of the Leech, but is more elaborate. Respiration is effected by the copious distribution of the blood to the integument of the body, and also by the admission of air by means of stigmata. The generative organs of the Earth-worm are situated in the anterior part of the body, their position being indicated externally by a considerable enlargement or swelling, which extends from the seventh to the fourteenth segment, counting from that in which the mouth is situated. They are hermaphrodite, but not dioecious; and the young are produced from eggs. Some species of *Annelida* are also reproduced by spontaneous division; and the Earth-worms, though they cannot be multiplied by mechanical division, yet have the power of reproducing small parts of their bodies.

The second order of Cuvier, the *Dorsibranchia*, are all inhabitants of the sea, and, as their name implies, they breathe by means of external branchial tufts, or tubercles, of singular and variable construction; in some cases these organs being spread over the entire body, in others confined to a few of the segments. They have mouths of a peculiar structure, capable of being turned inside out, and armed, in some species, with powerful teeth. The alimentary canal is similar to that of the abbranchiate worms, as is also the general course of the circulatory system. The organs of reproduction are but little understood; the species of *Nereis* seem to be self-propagating by spontaneous division; and, says Professor Jones, "some curious speculations have been entertained by continental writers relative to this mode of propagation. The tail of the original *Nereis* is still the tail of its offspring, and however often the body may divide, still the same tail remains attached to the hinder portion, so that this part of the animal may be said to enjoy a kind of immunity from death."

The *Tubicola*, Cuvier's third order, which inhabit pipes or tubes of

different construction, are very little known. Some secrete calcareous tubes, and others clothe themselves with shells, grains of sand, and other matter. Their organs of respiration and other appendages are placed near the head.

We now come to the second class of this division—the *Myriapoda*; and here we find animals capable, from the greater density of their external skeletons, to subsist on land. Their bodies consist of a series of segments, to each of which is appended one or two pairs of articulated legs; the anterior segment or head being provided, besides the mouth, with eyes and jointed antennæ. They breathe through spiracles, and the air is distributed internally by means of trachea. The segments of the body, and consequently the feet, increase in number with age, thus differing materially from insects. They are divided into two great families—the *Zulidæ* or Millipedes, and the *Scolopendridæ* or Centipedes; the former most nearly assimilate with the last class, the *Annelidans*. Their bodies are long and round; the feet, of which there are two to each segment, though articulated are yet very small, so that these animals cannot move very quickly; their mouths resemble those of the larvæ of some insects, while, like the *Annelidans*, they have a straight and very capacious alimentary canal.

The internal organization of the class *Myriapoda* is also similar to that of insects, while in other respects they materially differ; as, for instance, in the position of the sexual organs, which, in the animals we are considering, are situated at the anterior part of the body, like the *Annelidans*; while, among insects, they are invariably placed at the caudal extremity. Again, they differ materially in their growth and development. Perfect insects, that is, insects that have completed all their changes, have six legs, and are then capable of reproduction; while the Myriapods acquire, by the changes which they undergo, new segments and legs, and cannot propagate their species till two years after their last moult.

The second family of this class, the *Scolopendridæ*, are more highly organized than the Millipedes, and unite still further the *Annelidans* with the class *Insecta*. Their segments are fewer in number, flat instead of round, and more horny and tough than those of the last family; their legs also are larger and more pliable. Their nervous system is of course more concentrated and developed. Their mouths are very strong, and are armed with sharp curved fangs, perforated at their extremity. The alimentary canal is smaller than that of the Millipedes, in proportion to the nature of their food; the Millipedes living on vegetable substances, while these animals feed on animal matter. Their respiratory and circulating system seems to be like those of insects; and they also resemble that class in the position of their sexual organs, which, unlike the *Zulidæ*, are situated at the extremity of the tail.

We now come to the most interesting of all the classes we have yet examined—that of *Insects*, the only animals of the articulated division capable of flight; and, as was pointed out at the commencement of this division, we find that, instead of an outward skeleton, composed of numerous segments, they are here found condensed, and divided into only three separate parts—the head, thorax, and abdomen. The former, which is connected with the thorax by a moveable joint, containing the oral apparatus and instruments of the senses. The thorax consisting of three segments, united and supporting the legs, wings, and the abdomen, containing the viscera. But before arriving at the perfect state, all insects undergo certain metamorphoses, or changes from the egg to the caterpillar, thence to the pupa, and after that to the imago or perfect insect, and these changes have been variously classified by different authors. Professor Jones has selected that of Burmeister, who calls the first division *Insecta ametabola*.

The larvæ or caterpillars of these animals resemble the perfect insect, but have no wings, and the pupæ of those which have wings in the perfect state, possess rudiments of those organs. Some of this order have “sucking mouths composed of four fine setæ lying in a sheath,” as the *Hemiptera*, a familiar example of which we have in the Water Boatman, (*Notonecta*), so common in our ponds. The wings of this order, when present, are four in number, and the upper pair generally half-membranous, and the posterior portion membranous. Others have mouths with jaw-like mandibles and maxillæ, as the *Orthoptera*, of which we have a familiar example in the *Gryllus domesticus*, “the Cricket on the Hearth.” This possesses four wings, the posterior pair being larger than the upper, which latter are of a dense leathery texture. A third order, the *Dictyoptera*, a well-known example of which we have in the Cockroach, has four wings, when they exist, and these are of equal size, and never folded.

The second division, called the *Insecta metabola*, comprises those insects whose larvæ are possessed of legs, or without them, and the pupæ is quiet, or, if it moves, it does not eat. This division comprises the fourth order, *Neuroptera*, with four equal reticulated wings, and strong lateral jaws. The most perfect examples of this order are the Dragon-flies, though these insects form exceptions to the general rule given above, as their pupæ are eminently blood-thirsty individuals. The fifth order, *Diptera*, with little appendages, called poisers, in the place of posterior wings, and sucking mouths provided with setæ, and palpi, of which the common House-fly forms a familiar example. The sixth order, the *Lepidoptera*, with four wings covered with beautiful scales, and a long sucking proboscis; the representatives of which are too well known to need example. The seventh order, the *Hymenoptera*, with four naked wings, traversed by strong branching nervures, and larvæ generally without head or feet; such

are Wasps, Bees, etc. The eighth order, *Coleoptera*, or Beetles, with a pair of dense horny anterior wings, and a thin posterior pair, folded up when not in flight, whose larvæ possess heads and sometimes feet.

Having thus specified the orders, the author proceeds next to a description of the anatomy of perfect insects; and as regards their legs, instead of the stiff appendages of the last class—*Myriopoda*, we find a beautiful structure composed of five portions—the *coxa* or hip, the *trochanter*, the *femur* or thigh, the *tibia* or shank, and the *tarsus* or foot, which last is again divided into a variable number of jointed segments. Some insects are provided with hooks on the last joint of the tarsus, others with a single claw like the Louse, (*Pediculus*,) others again have flaps or suckers, and thick pulvilli, to enable them to climb vertical polished surfaces. The thighs of the posterior legs of some insects are greatly enlarged, to enable them to leap; others, by the enlargement of the tibia and other parts, possess the power of burrowing under the ground, while the legs of some swimming insects resemble oars. As regards their means of flight, the wings, which are invariably attached to the two posterior segments of the thorax, are very variable in their shape and structure, some have four, some two, and some none at all.

The outer integument of insects, which in this respect resembles the skin of vertebrate animals, consists of three distinct layers—the epidermis, the rete-mucosum, where the colouring lies, and the cutis or true skin; and each wing is only a kind of prolongation of this common covering, and is “composed of two delicate films of the epidermis, stretched upon a strong and net-like framework.” Many insects are also provided with other appendages, such as spines, hair, scales, etc. The muscular system of this class is highly developed, particularly in the legs and wings. Their mouths are wonderful instruments, and are either mandibulate or haustellate, the former, or perfect mouth, consists of an upper lip, (*labrum*,) an under lip, (*labium*,) two upper jaws, (*mandibulæ*,) and two under jaws, (*maxillæ*,) both pairs of which work horizontally; the lower lip is divided into two portions—the *mentum*, or chin, and the tongue. Besides these there are also some curious appendages inserted upon the *maxillæ* and *labium*, called *palpi*, or feelers. The suctorial or haustellate mouth, though it differs very much in outward appearance from the last, yet the parts composing it are fundamentally the same as those met with in the mandibulate class. These last mouths vary considerably. The *Hemiptera*, for instance, have four lancets, which are only the mandibles and *maxillæ* altered in shape, and they are enclosed in a sheath, the base of which is covered by a small scale; and these answer, the one to the *labium*, and the other to the upper lip of mandibulate insects; and the same general order is found throughout.

With regard to the digestive apparatus of insects, it consists of a delicate membranous tube, containing a crop, gizzard, stomach, and small and large intestines. The crop is only met with in *Hymenoptera*, *Lepidoptera*, and *Diptera*, which have no gizzard. The gizzard is found in mandibulate insects that live on solid, animal, or vegetable substances. In some instances, also, the small intestine is wanting, so that the stomach in such cases passes at once to the terminal large intestine or colon. Besides these, the digestive apparatus possesses occasionally various secreting organs, such as salivatory glands, bile vessels, and others. The respiratory organs of perfect insects consist of spiracles, from which a great number of delicate air-tubes or tracheæ spread out through the body, and by this process, the blood, which is all arterial, is being continually oxygenized, as it is brought in contact with the tracheal tubes.

In the nervous system of insects, we find a gradual concentration of parts. The principal ganglion, or brain, becomes considerably developed, and a chain of smaller ones runs on the base of the body, to guide the muscles of the legs and wings. Interesting experiments have been made with reference to this ganglionic nervous chain, and there seems good ground for presuming that, analogous to the distinct columns that exist in the spinal axis of vertebrate animals, there are at least two distinct tracts also in the central axis of insects; for, as Professor Jones observes, "It has been well ascertained that the nerves given off to the muscular system of the Homogangliata, are not derived from the ganglionic masses themselves, but from the cords which connect them together; while the nerves, distributed to the integument and external parts of the body, communicate immediately with the ganglia."

Various are the senses which insects possess. That of touch is common to all. It is evident also, that some at least, as for instance the Flesh-fly, have the power of smelling; while there are abundant proofs of their being able to hear sounds. Their eyes are of two kinds, simple and compound; and many insects possess both. As regards their means of reproduction, the sexes in all of this class are distinct, and the generative organs vary considerably in different tribes, and are of a complex description. Those of the female terminate in a common oviduct, attached to which are certain appendages called gluten-secreters and spermatheca; and in many insects there is a long external intestinal tube of elaborate construction at the end of the oviduct, called the ovipositor. The number of eggs laid by different species varies considerably; some, as the Flea, lay about twelve only, while the Queen Bee averages some forty or fifty thousand; but they are all beaten by the Termite, which, if it were to continue the process throughout a whole year, would, says Professor Jones, produce the astonishing number of two hundred and eleven millions four hundred and

forty-nine thousand six hundred eggs. The Aphides also are remarkable for their fecundity, as "a single sexual intercourse is sufficient to impregnate not only the female parent, but all her progeny down to the ninth generation;" and one of these insects, it is calculated, might be the great great grandmother of five thousand nine hundred and four millions of young ones.

With regard to the metamorphoses of insects, to which allusion has been already made, Fabricius has divided them into five kinds—the *Coarctate*, comprising all insects having a maggot larva without legs, and its pupa encased in a small oval sheath; the *Obtected*, having a six-legged caterpillar and a pupa, on which are indicated the future legs and wings of the perfect insect; the *Incomplete*, having a maggot, without or with imperfect legs, and a pupa having the form of the legs, antennæ, and wings perfectly distinct, though they are all still enclosed in cases; the *Semi-complete*, having a larva like the imago, but without wings; and lastly, the *Complete*, having a wingless imago, resembling the pupæ. But there are, says Professor Jones, "innumerable examples of metamorphoses which will not conform to any of the above descriptions." The larvæ or caterpillars differ considerably from the perfect insect in their external parts. The viscera of the former are much more enlarged than those of the latter, for obvious reasons. The caterpillars also possess the power of secreting silk, which is subservient to the purposes of locomotion, and is also used for protecting the defenceless pupa. The spinnaret, or orifice through which the thread issues, is situated in the labium or under lip, and is a simple nipple-shaped prominence. While growing, the skin of the caterpillar is cast off at intervals, and when the moult takes place, not only is the skin removed, but every part of the outward covering down to the jaws and the cornea of the eyes goes with it. It is in the nervous system, however, that the most interesting change takes place during the insect-metamorphoses; and this beautifully illustrates the important principles on which the arrangement of the animal kingdom by the distribution of the nerves depends. In the larvæ, the ganglia are numerous but small; in the pupa state, the principal ganglion increases while others coalesce; and when arrived at the imago or perfect state, we find a concentration of the nervous centres adapted to the animal's increased necessities; and the number of the small ganglia is still farther reduced, and encephalic ganglion or brain still more highly developed.

Having now considered briefly the anatomy and economy of insects, we come to the next great class, the *Arachnida*—animals whose external skeleton presents only two divisions—the cephalo-thorax and the abdomen; they also differ from insects in the following ways—they have in their perfect state eight instead of six legs, eyes invariably smooth and of a

more perfect organization, their sexual apertures are also situated beneath the thorax or at the base of the abdomen, and their respiration is generally carried on by means of lungs instead of tracheæ. This class is divided into the great groups—the *Arachnida trachearea*, which is an intermediate type between insects and true *Arachnidans*, the *Pedipalpi*, and the *Araneidæ*, the two last being also classed together under the name *Arachnida pulmonaria*. The first division comprises the mites, (*Acaridæ*,) and the *Pseudo-scorpionidæ*. Their bodies are divided into cephalo-thorax and abdomen, they have eyes never exceeding four in number, and resembling the eyelets of insects; their mouths are adapted to suction, and they have strong piercing jaws; they breathe by means of tracheæ, as in insects, though their spiracles are different. Little is known accurately of their internal configuration, owing to their minute size. The Pulmonary Arachnidans, comprising the two last divisions, are carnivorous in their habits.

In the *Pedipalpi*, or Scorpions, the mandibles of the insect world are represented by a pair of small forceps, and the maxillary palpi are very greatly enlarged, and resemble the claws of Crustaceans. In the Spiders the mandibles are terminated with a sharp moveable perforated fang, while the maxillary palpi in the females terminate with a simple hook, and in the males are provided with forceps. In both Scorpions and Spiders the alimentary canal is very narrow, and is surrounded with a quantity of fat, as in the larvæ of insects. Their respiratory system is very peculiar, being a combination of gills adapted to water, and lungs of air-breathing animals. It consists of a series of pulmo-branchiæ, each of which opens externally by a sort of spiracle; they possess a rudimentary vascular apparatus for the circulation of the blood, which seems not to be confined in veins, but wanders slowly in wide sinuses or cavities throughout the body, and is thus brought back to the arteries, to be again propelled through the system. The nervous system of Scorpions and Spiders differs, however, somewhat in character. In the former, it is still ganglionic, though more concentrated and enlarged than that of insects, each ganglion moreover is united by three intermediate nerves; but in the *Araneidæ*, or Spiders, we find the whole chain of ganglia inserted into one brain, from which nerves radiate to all parts of the body. The eyes of Arachnidans are far superior to those of insects, and resemble greatly in their construction those of vertebrate animals. Their sexual organs, both male and female, are very simple in their character. The *Araneidæ*, or Spiders, like the larvæ of insects, possess the power of spinning; but instead of a single prominence, the former possess four spinnarets, each of which is perforated by innumerable orifices, so that, instead of a simple line, each thread is composed of numbers of small cords woven together.

The last class of the great Homogangliate division, the *Crustacea*, are

principally marine in their habits, but they are also found abundantly in our lakes and ponds. Their outward appearance resembles that of insects in structure, being composed of three parts—a hard cuticular secretion or shell of a calcareous nature, a coloured pigment, and a vascular dermis. These animals, in their lowest form, correspond with the condition of the skeleton met with in the Myriapoda and in the larva of many insects, “the whole body being composed of a series of similar segments, to which are appended external articulated members of the simplest construction,” and we shall find, as we examine the more organized tribes, that there is a gradual concentration of these segments, and a consequent corresponding coalescence of the nervous system within. The quantity of rings in the body of each species is supposed to be the same, the normal number being twenty-one, seven of which belong to the head, and seven each to the thorax and abdomen; and, in illustration of this theory, Professor Jones brings forward the *Talitra*, as having the seven cephalic segments all united, but their existence indicated by seven several pairs of appendages, while the seven thoracic and abdominal segments are all distinct; the Lobster, (*Astacus marinus*), as having the fourteen cephalic and thoracic rings all joined together, but the abdominal segments still distinct; and Crabs, as being still more united; and one, the King Crab, (*Limulus Polyphemus*), as having the division of the abdomen also obliterated; and, as he well observes, we cannot but trace, as we review this comprehensive class from the lowest to the highest types, the same steps “whereby we pass from the Annelidans to the Myriapods, and from thence to the insect, the Scorpion, and the Spider.”

The Decapod division of this class is alone noticed in the Professor's work, and it is divided into three extensive families—the *Macroura* or swimmers, the *Anomoura* or Hermits, and the *Brachyura*; of which last the Common Crab is a familiar example. Of the first of these groups the best known is the Common Lobster; it has five pairs of articulated limbs on each side of its mouth, used for the prehension of food, which are called foot-jaws. The next pair of legs succeeding to these are very remarkable in structure; they are thick and muscular, and are armed with chelæ or claws, one pair being provided with sharp teeth for tearing prey, and the opposite with large blunt tubercles, for holding fast to any submarine matter. After these come four pairs of slender legs, the two first having also a pair of feeble foreceps. These last pairs of legs are but little used for locomotive purposes, as the *Macroura* always employ their tails in swimming, and if the former were more powerful, they would necessarily hinder the action of the latter.

The next great family, the *Anomoura*, or Soldier Crabs, have the hinder part of the body soft and coriaceous, which they protect by forcing

it into any convenient empty shell. In their structure they are analogous to the Lobster, though widely different in shape. Their chelæ or claws are of different sizes; the two succeeding pairs, unlike those of the Lobster, are very strong, and, instead of forceps, terminate in a sharp point, to enable the animal to move along; and their tails, instead of being provided with lamellæ for swimming, are transformed into a sort of leg-like appendages, to enable them to hold on to the inner part of the shells which they inhabit.

The *Brachyura* have much more concentrated skeletons, their tails are very short, they have powerful chelæ, and their legs are adapted for walking on land. At certain times of the year crustaceans change their skin, or rather shell; they cast off every part down to the very joints in a remarkable way, and a new one comes in its place. The alimentary canal of these animals is very simple, and consists of an œsophagus, a stomach, in which is contained a singular masticating apparatus, and a straight intestinal tube, it is also provided with a liver and biliary ducts. Their circulatory system consists of branchiæ, variously disposed, in the lower orders the legs used in swimming have certain fringed lamellæ appended to them, which exercise this function; in the higher orders these lamellæ are attached to the tail and sides of the body, near the origin of the legs. The heart of the lower orders of this class is a dorsal vessel, similar to that of insects, but in the decapod division it becomes more centralized. It is possessed of various large arteries, which disperse the blood through the body, and the venous apparatus analogous to that of spiders, consists of delicate sinuses or cavities which freely communicate with each other. The nervous system of this class passes through all the gradations of development met with throughout the Homogangliate division of the animal kingdom. The lowest types indeed of the *Crustacea* are actually less highly organized in this respect than the humblest *Annelidans*, for, in the latter, we always find the two lateral masses of the supra-œsophagal ganglion united, but in some *Crustacea*, as *Talitrus*, this lateral division is perfectly evident. As we rise higher, however, we find a gradual concentration of the nervous chain, until at last, in the Common Crab, the whole is gathered into one mass or brain, from which radiations are thrown out to all parts of the body; a type of development equal to, but not higher than, the Spider.

Allusion has before been made to a division of the ganglionic chain in the class *Insecta*, similar to that found in vertebrate animals; and the same character is met with in the class we are now considering. Each ganglion consists of two portions, and it is supposed that the inferior is connected with sensation, and the superior with the movements of the body; which arrangement, however, is precisely opposite to that met with

in the higher class vertebrata. A singular power that the *Crustacea* possess must not be omitted; they can break off their own limbs at pleasure, which, as the author observes, "is an indispensable provision in their economy," for, as their blood flows in wide sinuses, instead of being confined in narrow veins, if a limb happened to be fractured, the blood would inevitably escape, the Crab therefore breaks off the injured member at a particular place where one of these sinuses ends, and the bleeding is thus effectually staunched. But the most remarkable thing is, that when broken off, notwithstanding the high organization of these creatures, another limb gradually appears in its place.

The eyes of crustaceans are either simple, aggregated, or compound. The first resemble those of Spiders; the second are composed of a number of simple eyes placed behind one common cornea; and the compound are constructed like those of insects. In the two highest orders these organs are placed on moveable pedicles. They possess a distinct auditory apparatus of a very simple character. In their generative system they are very peculiar, these organs on each side of the body of both male and female being perfectly distinct both internally and externally. The females almost invariably carry their eggs about with them till they are hatched; and for this purpose some of the minute *Crustacea* and *Entomostraca* have little bags attached to the hinder part of their bodies, while the *Decapods* carry their eggs attached to the under part of their tails. These *Entomostraca* resemble the *Aphides* in one very peculiar fact—they are capable of producing, from a single intercourse, fertile eggs for at least six generations. The young of the *Crustacea* are not like their parents when hatched, but undergo a sort of metamorphosis, like the insect world we have already considered; and the Common Crab appears at first in the most grotesque shape, and takes several months before it arrives at its perfect form.

Uppingham, March, 1857.

BIRDS' NESTS.

BY O. S. ROUND, ESQ.

IN my former papers upon the habits, instincts, and formation of birds, I have endeavoured to trace the use, ornament, and pleasure which the system of creation receives from their presence. What a beautiful and interesting class of beings they are, and how much they deserve the consideration of those who take a delight in contemplating the wonderful works of nature! I will proceed now to speak of that peculiar feature in their instincts, which is only observed in very few animals beside, and

which finds no analogy generally, except in the insect and reptile tribes; I mean the nest. This admirable and pleasing structure is one of those things which every one, except those brought up in a city, is acquainted with from the earliest period, and to find which is one of the chief amusements of our boyhood. Who does not mingle in his earliest reminiscences the joy he felt on lighting upon the pretty little retreat of the Hedge Sparrow, with its four or five bright blue eggs; or the thoughtless manner in which perhaps he bore the prize away; but was he struck with the beautiful workmanship of the little habitation, or did he contemplate it for a moment otherwise than as a prize which he had the cleverness to discover, and took as the lawful reward of his discernment? The nest was probably taken merely for the sake of its general pretty appearance; and the eggs which it contained, and which, blown and strung, formed the pleasure of the playful hour, were soon broken and cast away with their previously disregarded receptacle. I do not speak of this in austerity or grave reproof, for I well remember doing the like; but I only wish my readers to ponder upon this reflection, or call it to mind the next time this temptation offers. I would merely have them think of it in a reflective manner, so that they may enjoy the pleasure of the contemplation without being the unthinking means of pain to even so insignificant a creature as the builder of that little nest, by robbing him of his home; temporary it is true, but still his home.

As birds are doubtless a great addition to the full enjoyment of rural life by their song and presence, so it is in the capacity of trainers of their helpless brood that they chiefly awaken our sympathies. The secrecy and care which they bestow in their domestic economy, next claim our attention, and we are naturally led to an observation of the progress of their household affairs. It is the aim of every one of us men to (what is called) settle in life, that is, obtain sufficient to have a house and establishment of our own; we then marry, a family springs up around us, we educate and place them in the way of doing as we have done; this performed, old age has come upon us, and we must turn all our thoughts to that second state of existence to which we may be called hence at any moment, but which we are perfectly certain cannot by this time be far distant.

Now, what is this other than the life of all animals, and birds more particularly; for, if we think of it, we shall find the resemblance sufficiently complete, only, that in all matters of instinct, every part of the duties of life is performed with a punctuality which affords a very useful lesson to us, superior as we think ourselves. Thus the nestling, as soon as he can, performs small journeys in the air or on the earth, gains strength very rapidly, and in a very short period commences life on his own account, feeds himself, and spends the autumn and succeeding winter in that sportive

manner which may well answer to our own childhood; possessing by nature first, and by the tuition of his parents and practice afterwards, most of the acquirements which are necessary for his support. Thus it is no uncommon sight, and a very pretty one, to see a pair of old birds instructing their young in flight, fluttering round them, waiting on them, and encouraging them to try their own powers.

The development of these powers varies very much in different species; thus, all the water-birds are clothed only with a kind of down for a considerable period after their exclusion from the egg; the reason of this is manifest, for flight is not their primary qualification, but only an auxiliary to swimming or wading, which they can exercise almost from the moment they are hatched. Again, those birds which are essentially fliers have their feathers already in progress of growth at their birth, and in a surprisingly short period use their wings for many hours during the summer day. There are others, such as the gallinaceous, or fowl and pheasant tribe, which trust more to their legs, and are for a considerable period imperfect on the wing. Thus we may trace in this as in every other stage of animal life, the wonderful and perfect adaptation of the means to the necessities of the individual. But before they can arrive at their first anniversary they must encounter many and great dangers, which their inefficiency in motion and experience renders them peculiarly liable to. Among these not the least is migration, which is no mean undertaking, and with some, such as the Swift, must take place in about five weeks only from the time the young are produced. What an extraordinary reflection is this, that creatures so helpless as these appear to be, should, in so brief a space, be traversing the fields of air over the vast ocean to realms which they are to visit for the first time, and which, if they are accidentally separated from the rest of the flock, a thing very likely to occur, they can only reach by that wonderful instinct which is such a necessary guide. This reflection has, I know, been before made, but it must strike the most unobservant with astonishment.

If this is likely with regard to such powerful fliers as these, how much more with the summer birds of passage; in fact, as I have elsewhere observed, the waste which takes place by contingencies is generally found to bring the numbers which arrive pretty nearly even every spring. And now begins the bird's real entrance into the actual business of life. With our own kinds the latter end of February usually sees all (except such as are polygamous, which are gallinaceous birds,) arranged in pairs. In my article on "The Effects of Spring," I have touched upon this part of the subject to observe what a difference of manner this mode of life produces, softening and domesticating to a certain degree even the wildest. The migratory birds are seen in pairs immediately on their arrival, and I am inclined to think

that they so arrive on our shores, as I have very many times had the first view of summer birds of different kinds in couples.

The time at which the different kinds of birds begin the business of building varies very much; I think the earliest of any is the Raven; this bird often has been known to have young in February, which, allowing for the time occupied in sitting, brings the actual building into January itself; but these instances must be in mild seasons. All the Crow or Pie kind are early builders, and use more or less the same kind of material for their nest; this is usually some kind of dead stick, lining with wool; Magpies alone of the Pie kind cover their nests entirely over, and use a vast quantity of materials, amongst which much black-thorn twig is usually found. The nesting of Rooks is too well known to need particular description; the Jackdaws mingle with them, and generally form a part of a Rookery; Magpies and Jays frequent woods, and build in the tops of moderate trees.

The eggs of all this family are more or less grey and freckled, except the Jay, whose eggs are of a dull colour freckled with a dull pink. His nest is also much closer than the other, and usually formed chiefly of roots, and lined like the others with wool and soft materials.

Among the first nesters we may reckon the Ouzel tribe; the Blackbird usually having young early in April; and Thrushes are not far behind. Now, this genus differs exceedingly in the formation of the nest; for, whilst the Blackbird uses a good deal of loose moss and sticks, cemented with black mud and lined with dry grass, the Thrush has a much larger nest, lined, and in fact composed almost entirely of rotten wood, which is so beautifully moulded within, as to resemble a cocoa-nut shell, the outside being kept together by green moss; whilst the Missel Thrush uses clay, lines the same as the Blackbird, and uses white moss on the exterior: the two first build in low trees or bushes, the last usually in high trees, though sometimes very near the neighbourhood of man. The eggs of the Blackbird are green speckled with brown; the Thrush the same colour but brighter, spotted with black; and the Missel Thrush very light grey dotted with red—a very remarkable discrepancy in birds of such analogous form and habits.

The nest of a bird bears no manner of proportion to its bulk, for it is remarkable that the Wren, which is next to the smallest British species, makes a nest much bigger than that of the Ringdove, which has fifty times the bulk; whilst the Ostrich, the biggest of all, makes none, but deposits its eggs on the bare ground. The Titmice, with one exception, build in holes of the earth, of trees, or some building, the Great *Parus* usually preferring a hollow tree or secure eave of a house. All these use green moss, rabbits' fur, and feathers, and lay a nest full of eggs, which

are white with red dots. The exception I allude to is the Long-tailed or Bottle Tit, so called from the shape of its nest, which is exactly that of a soda-water bottle, with an opening on the side, made of the same materials as the other, mingled with a little white moss on the exterior; this is generally found in hedges, and an elegant little structure it is, usually containing twelve or fourteen eggs, which are white.

Now, the Wren, as I have before observed, builds a very large nest, which, from the situation she chooses for it, usually in the side of a stack, or wadded wall of an outhouse, or interior of the roof, or eaves, is necessarily covered in; and hence, when built, as it sometimes is, in bushes, it preserves the same shape, although the necessity no longer exists. Thus we see the palpable distinction between reason and instinct, which, although it performs the greatest wonders, cannot adapt itself to circumstances. The Wren's eggs are white with small reddish speckles, and generally seven or eight in number; this bird, as I have elsewhere observed, is very prodigal of her labour in nest-building, for it is not uncommon for one pair of these birds to erect five or six nests within a short distance of each other; this has never been satisfactorily explained, but the most probable supposition is, that it is a cunning artifice to divert the attention from the true nest, which is seldom discovered.

As the Wren builds in such situations as to render it expedient that her nest should have a cover, so her relative with a golden crest, takes the foliage of a horizontal spruce or cedar bough for her protection, and makes an open nest, suspended by cordage formed of cobwebs, hair, moss, fine twigs, roots, etc. This elegant little bird is no less elegant in its arrangements, for the materials it collects are of the finest description, moss, lichens, rabbits' fur, feathers, wool, all on a fine scale and beautifully entwined, so that her little dozen of cream-coloured pea-sized eggs make a pretty picture. Now we might suppose that the Willow Wrens, so analogous as they are to this bird in their mode of life, would choose the air for their house, and not build on the ground, and cover in their nests, with a small entrance on the side, so that the green moss and grasses which they use mingle and confound themselves with the surrounding herbage. Their eggs are universally white with red dots, those of the Wood Wren being darkest and roundest.

Wagtails use very light materials, such as fine grasses and feathers, and build usually on the banks of fresh waters, and lay five or six white eggs speckled with black, very like those of the House Sparrow, which uses the same materials, but in a vast quantity, and covers in, preferring the eaves of houses or overhanging boughs of trees.

(To be continued.)

ON UNITY OF SYSTEM.

(Continued from page 74.)

THE following notes, commencing with geology, are put together in order to indicate the outlines of the system to which this law is applicable, and will serve as an introduction to a more detailed account of the variety of instances in which it is manifest.

The law of Nature before mentioned being applied to the Bible, is found to be in exact accordance therewith, and it is obvious that they are both characterized by the same beautiful simplicity, and are both parts of one system, and both partial revelations of the plan on which God has ordained creation. The acquaintance with one, as it advances, confirms and illustrates the other, and the same means have conduced to the progressive understanding of both in the latter times. Though the knowledge of Nature and that of the Bible are continually increasing, yet they are both suited to all epochs, and nations, and periods of life, and both contain much of what interests children, and of what is beyond the human understanding.

The progressive study of Nature and of the Bible always corrects and modifies the earlier impressions, many of which are successively found to be erroneous, and are designed to be so, for an enlarged acquaintance with Nature and with the Bible is quite unsuited to the early ages of mankind,* to uncivilized nations, and to children, though all these can understand as much of them as it concerns them to know, and what is therefore specially adapted to them.

Till about a century ago system was hardly applied to any of the natural sciences, nor was Nature often appealed to by experiments or proofs, but since that time the progress has been very great, and shews as it increases that there is far more yet undiscovered, and that the knowledge of system is still very imperfect, though the appliance of system is now becoming more and more necessary.

The beauty of the laws of Nature, with all their modifications and adaptations, is year by year more apparent and more admired, and they are now divided into very numerous branches, and each of the latter is sufficient for the study of one man. These laws, and the laws which are developed in the Bible from the beginning to the end, are equally laws of God, and indeed the same laws, though differently applied, and they are therefore more or less disregarded by every one who neglects the study of the Bible, or the investigation of Nature. And, as a knowledge of one is in some degree dependant on that of the other, an acquaintance with both is especially requisite for those who profess to know or to teach either of them. Any adding to, or taking away from the laws of Nature, would destroy their efficiency, or the perception of their perfectness; and the same

* I cannot admit this, though I have no doubt the writer means well.—F. O. MORRIS.

remark applies to the Bible, and accords with the injunction at the close of the latter.

It has been already mentioned how each creature, both in itself and in relation to others, is figurative of the whole creation, though only partially so; for the laws of Nature, like the Deity who has ordained them, are never fully disclosed. In like manner periods of thousands of years are prefigured in the Bible by means of a few words, and by the description of a single event.

The whole Bible is one continued and progressive preparation for another life, and its tendency from beginning to end is to disengage man successively more and more from the earth; the law of degradation before mentioned being the means applied.

This law, with regard to man, has three divisions; the first being degradation or destruction, on account of the prevalence of evil, and of a total inaptitude for a better state of existence, as the creatures of each of the early epochs, when they had attained their most flourishing state, began to dwindle and to pass away. The second division is humiliation or repentance of evil; and the third is self-renunciation, or a voluntary separation from the present state. This last is

“That golden key,
That opens the palace of eternity.”

It appears figuratively in most of the events and circumstances mentioned in the Old Testament, is more distinctly enjoined by the Prophets, and is fully and continually disclosed throughout the New Testament. There is no compromise or reservation; total renunciation is there required, and it insures perfect liberty, as an existence independent of this life being then without fear and doubt. Love is the motive for a change of state or of situation on the earth, and the greater the change the more must be the love for the state to come; all the various events of life being preparatory to, or figurative of, the final change. Riches, birth, rank, honours, learning, imagination, and all other advantages, and all virtues which are only suited to this life, must be inwardly renounced, for they will all cease with the present existence. Self-renunciation is true faith, and is all that is required of man, for its motive must be love, and it will shew itself by good works when it has the means, though it will be equally efficacious without them, as frequently no means are allowed for them. It is easier to renounce vices than to renounce trust in virtues, as appears by many examples in the Bible; and the ignorant and savage having little to trust to, are often more easily induced to self-renunciation than are the civilized heathen, with their elaborate laws, and ceremonies, and mythology. The Jews having most to trust to, and not seeing beyond their law, are most difficult to convert to Christianity.

The system disclosed throughout Nature, and throughout the Bible, is totally opposed to the prevalent opinion that Christianity begins where heathen virtues cease, or that the latter are the ground-work on which the former must be exalted. It is also equally opposed to all human plans for the advancement of mankind, these plans being adverse to self-renunciation.

(To be continued.)

AN ENTOMOLOGICAL DREAM.

(Concluded from page 109.)

NEXT came a crowd, about seven or eight,
Who, with downcast looks and shuffling gait,
Pass'd quickly by, as tho' shunning my gaze;
"Who, and what are these!" I cried in amaze;
Whereupon I was told a grievous tale
Of some, who had precious insects for sale,
Which, though born and bred in a foreign
land,

Yet became, when *bought* by this worthy band,
Undoubtedly *British*, as all were told,
With unfalt'ring tongue and countenance
bold!

And now, Muse, assist, and lend me thine aid,
While I tell how collections *may* be made.
Send to dealers for insects "rich and rare,"
And freely give sixpence for every pair;
Then quickly send letters south, east, and
west,

(Beginners t' address, you'll find much the
best,)

"An insect much prized—to collectors dear,
I'm in the habit of taking down here,
In our cabinets rarely is it seen,
A *British* specimen's a prize I ween.

I gladly send you one, and hope you'll be
Not slow or long in remembering me."

Oh! surely 'tis sad and mournful to find,
That these lovely fruits of the Master Mind
Should envy, deceit, and dishonesty raise,
Rather than meek adoration and praise!

And yet it is so; and many there be,
Who, if in a friend's collection they see
An insect they have not, are fill'd with grief;
And, to give their minds a little relief,
Will quickly a foreign specimen get,
And when, with neat hand it has been re-set,
'Tis plac'd in their drawer—the business is
done,

Their heart's earnest, though paltry, aim is
won;

For they'll tell you with bright and sparkling
eye,

"None have a finer collection than I."

With pleasure I saw *these* shades pass away,
To make room for one with air bright and
gay.

With countenance cheerful he took his stand,
Books on his back and a pen in his hand.

"Un Entomologiste bon, et loyal,
Membre de L'Acad. L. C. Imperiale
Connu sous le nom de guerre de Latreille
E....d N....n deservedly 'bears the bell.'"

As a writer he's able and clever,

As anatomist, he can dis sever

With such skill, that I scarce can fail to
see

The structure of e'en the "industrious flea."
He edits numerous excellent works,

Regardless of sneers, of quips, and of quirks.
But *my* chief praise the "Zoologist" claims

In whose pages each tyro's ardour flames;
Though some there be, too ready to scout it,

Th' Entomologist can't do without it;
Of all like works that are seen in its wake,

We can't doubt its right, precedence to take!
"Intelligencer" and "Naturalist,"

"Annual," "Manual," all would be miss'd;
But the work which gave birth to one and
all,*

Has, in *my* opinion, a prior call.

Though full of instruction it's far from dear,
It costs but twelve shillings for a whole year.

Success to the Z. and E. N....n then,
And long may he wield the Editor's pen!

Now this worthy editor scarce was gone,
When he was speedily followed by one

Of whom I must speak with a tongue discreet.
He has a snug little berth in the Fleet Street,

Where lies enshrin'd a wondrous collection,
Which I should view with far more affection,

* The writer here surely forgets Loudon's "Magazine of Natural History," and the first series of
he "Naturalist."—F. O. MORRIS.

Had it been made by myself, and did I know,
That I had captured each beautiful row!
The skill and the labour here may be seen
Of Bouchard, Weaver, and Foxcroft, I ween;
A collection thus made, I must confess,
Would appear to me almost valueless.
But if it be said 'chacun à son gout,'
"There's my collection, and what's it to
you,"

"How, or by whom it was made?" I would
say

Nothing more than this—that surely I may
My opinion give, that in a dispute,
Those only with *confidence* should refute,
Whose assertions are based on facts they
know,

And not on the *hearsay* of high or low.
Mr. S.....d excuse this slight reproof,
As "rustic," perhaps I should keep aloof;
Yet I can't but say to me it seems plain
That we "rustics" more experience can gain
In the wood, the field, and the breezy down,
Than *you* in the fog and smoke of a town.
Scarce had this shade vanished into thin
air,

Scarce had I recovered his angry stare,
Than one, with a free jaunty look skip'd by
So fast, that he well nigh escaped my eye.
Though so quickly lost in the distant haze,
I saw quite enough to attract my gaze;
I saw it was one who stands very high
In "Microlepidopterology!"
I'm an "incipient", in poetic fire,
I've never before struck the Muses' lyre;
So pardon this word of syllables nine,
Which makes such a very convenient line.
And now, reader, lend an attentive ear,
(Tis but a *shade*—you may gaze without
fear.)

While I endeavour, though with powers faint,
Great S.....n's characteristics to paint.
He's author, critic, reviewer,—yet know
Still ambitious feelings within him glow.
Though in some respects he ranks very high,
Yet that rank he beholds with scornful eye;
With gait erect, with his head in the skies,
This line to *himself* he often applies,
(And, though charged with presumption,
he'll brave it.)

"*Nihil tetegit, quod non ornavit.*"

So superior he feels to *all* around,
That in common justice he feels he's bound
To say so: and should any luckless wight
Presume to confront so brilliant a light

His irate pen composes a "leader"
To soothe himself, and amuse his reader.
Or seated high in the *critical* chair,
Abusive epithets darken the air;
"Demented," "absurd," and "nonsense,"
are terms

Which he freely bestows on such poor worms
As Guenée and Westwood: unhappy pair!
How did ye this critic tempt from his lair?
"Unscrupulous" authors, who write but
"trash,"

To make an Entomological hash,
Who "from previous authors copy wholesale:"
Such charges indeed make a mournful tale!
But review *him*, expose *his* great mistakes,
And an ominous growl the silence breaks.
Oh! be wise, be still, or you'll surely rue
(See "Substitute" second—pages one, two.)
The hour, in which you the liberty took
To hint that there might be faults in his
book.

And yet, at times he can pleasantly write;
When "up in his subject," he throws much
light

On knotty details, reveals hidden things
Touching Microlepidopterous wings.
With a fluent pen he can tell us how
He took his journey from Ghent to Glogau;
But in sober truth we owe him real thanks
For having filled up so many sad blanks,
Which, up to his time had stifled the zeal
Of many a tyro, and made him feel
That while on ignorance's wave he was tost,
His time and his toil were 'love's labour
lost.'

But now, thanks to him, we can boast I'm
sure,

An Entomological literature.

The "Intelligencer," and "Annual,"
The "Substitute," also the "Manual,"
Are the goodly fruits of his teeming brain,
And may plead his excuse for being vain.
Then take a sincere admirer's advice;
Remove from your writings that bitter spice
Of taunt and sarcasm, and rest assured
More readers will to your works be allur'd.
Next followed a crowd, whose well-deserv'd
fame,

A more gifted pen than mine must proclaim.
One name more and my pleasant task is done,
An undying garland I shall have won.
'T would ill become *me* to say very much
Of the man who grasped with delighted
clutch,

The Royal Society's medal of gold,
 Reward for the many facts he had told
 In insect economy: and therefore
 Should any be disposed to say "wherefore?"
 Any answer but this, I must decline,
 "I wish an honour so great had been *mine*."
 Now methought, when in solemn pomp, the
 last
 Of this dim and shadowy throng had pass'd,
 The same soft voice whispered thus in my
 ear,
 While my cheek was chilled with a crystal
 tear,—

"The Genius of Natural History weeps
 When the spirit of love and concord sleeps;
 When those, who with one glad accord
 should raise
 A hymn of rapt adoration and praise,
 Rather use those words of anger and strife
 Which embitter the fleeting hours of life!"
 With these sad words, she was passing away;
 When, clasping her knees, I besought her
 stay.
 But it could not be, and from me she broke,
 The shock overcame me, and I awoke!
 OUTIS.

ADDENDA TO THE BIRDS OF NOVA SCOTIA.

BY MAJOR WEDDERBURN.

(COMMUNICATED BY CAPT. J. M. JONES.)

Pectoral Sandpiper.—Extremely common at Cole harbour, and various other places.

Schinz's Sandpiper.—Extremely common at Cole harbour, and various other places.

Purple Sandpiper.—Very common: Cole harbour and coast generally.

English Scaup.—I have a specimen shot in Halifax.

American Scaup.—I have a specimen shot in Halifax.

Ivory Gull.—I saw one in Halifax harbour.

Brunnich's Guillemot.—A species answering to this in every particular, except having a thicker bill and white at base, is very common.

Red-throated Diver.—Common in winter.

Red-necked Grebe.—Very rare.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 110.)

GALIDICTIS.

Galidictis vittata, Guer. Schinz. Mus-
 tela striata, Geoff.

VIVERRA.

Viverra Civetta, Schreb. F. Cuv. Schinz.

Viverra Zibetha, Linn. Schreb. Raffl.

Griff. F. Cuv. Schinz. V. Tangelunga, Gray. *V. undulata*, Gray.

Viverra Rasse, Horsf. F. Cuv. Schinz.

V. Indica, Geoff. *V. pallida*, Gray.

Viverra Boiei, Schinz. *V. Bojei*, Müll.

V. fasciata, Gmel? *Paradoxurus Derbianus* Gray.

Viverra gracilis, Desm. Schinz. *V. Linsang*, Hard. *Felis gracilis* et *Prionodon gracilis*, Horsf. *Linsang gracilis*, Müll.

Viverra Abyssinica, Rüpp. Schinz.

Viverra Fossa, Schreb. Desm. Schinz.

Viverra Genetta, Linn. Schreb. Desm. Schinz.

Viverra poensis, *Waterh. Schinz.*
Viverra pardicator, *Schinz.* *Prionodon*
pardicator, *Hodg.*
Viverra Bengalensis, *Hard. Schinz.*
Viverra melanura, *Hodg. Schinz.* *V.*
orientalis, *Clelland.*
Viverra Richardsonii, *Schinz.* *Genetta*
Richardsonii, *Ann: Nat: Hist.*

HERPESTES.

Herpestes Pharaonis, *Schinz.* *Viverra*
Ichneumon, *Linn. Schreb.* *Ichneumon*
Pharaonis, *Geoff.* *Mangusta*
Ichneumon, *Fisch.*
Herpestes caffer, *Licht. Wagn. Schinz.*
Herpestes thysanurus, *Wagn. Schreb.*
Schinz.
Herpestes leucurus, *Ehren. Rüpp.*
Schinz. *Ichneumia albescentis*, *Guer.*
Herpestes albicaudus, *Cuv. Schinz.*
Ichneumon albicauda, *Isid Geoff.*
Guer. *I. albicaudus*, *Smith.*
Herpestes gracilis, *Rupp. Schinz.*
Herpestes sanguineus, *Rupp. Schinz.*
Herpestes Mutzigella, *Rupp. Schinz.*
Herpestes Zebra, *Rupp. Schinz.* *H.*
taenianotos, *Smith.* *H. fasciatus*, *Des.*
Ogyl. H. Mungo, Desm. *Viverra*
Ichneumon, *Schreb.*
Herpestes Atilax, *Schinz.* *H. galera*,
Wagn. *H. Urinatrix*, *Smith.* *Atilax*
Vansire, *F. Cuv.* *Ichneumon galera*,
Geoff. Desm. *Mustela galera*, *Erzl.*
Schreb.
Herpestes fuscus, *Water. Schinz.*
Herpestes Javanicus, *Mull. Geoff.*
Desm. Horsf. F. Cuv. Schreb. Schinz.

Herpestes auropunctatus, *Schinz.* *Man-*
gusta auropunctata, *Hodg.*
Herpestes pallidus, *Schinz.* *H. griseus*,
Ogyl. Desm. *Ichneumon griscus*,
Geoff. *Mangusta grisea*, *Fisch.* *M.*
Malaccensis, *Fisch.* *M. Nyula*,
Hodg. Schreb. Wagn.
Herpestes badius, *Smith, Schinz.*
Herpestes vitticollis, *Bennett, Schinz.*
Herpestes Gambianus, *Ogil. Schinz.*
Herpestes pulverulentus, *Wagn. Schreb.*
Schinz.
Herpestes exilis, *Schinz.*
Herpestes Widdringtonii, *Gray, Schinz.*
Herpestes Bennettii, *Schinz.*
Herpestes Smithii, *Gray, Schinz.*
Herpestes Nepalensis, *Gray, Schinz.*
Herpestes brachyurus, *Gray, Schinz.*

CYNICTIS.

Cynictis Ogilbyi, *Smith. Schinz.* *Her-*
pestes penicillatus, *Cuv. Wag.*
Schreb.
Cynictis lepturus, *Smith. Schinz.*
Cynictis Steedmanni, *Ogyl. Schreb.*
Wag. Schinz.
Cynictis melanurus, *Wieg. Schinz.*

GALIDIA.

Galidia concolor, *Guer. Schinz.*
Galidia elegans, *Guer. Schinz.*
Galidia olivacea, *Geoff. Guer. Schinz.*

CROSSARCHUS.

Crossarchus obscurus, *Fr. Cuv. Fisch.*
Schinz.
Crossarchus rubiginosus, *Wag. Schreb.*
Schinz.

(To be continued.)

Miscellaneous Notices.

A Natural Curiosity.—A Yellow-breasted Martin, a bird which is said to abound in North America, and is occasionally seen in France, but very rarely met with, we believe, in England, was caught a few days since in a plantation the property of W. James, Esq., of Barrook Park, near this city. The bird

is a very beautiful specimen of its kind, measuring thirty-two inches from beak to tail. Mr. James, we believe, is having it preserved.—*From the "Carlisle Patriot, communicated by T. K. ATKINSON, Esq.*

Occurrence of the Tree Sparrow in Devonshire.—A few days since, when examining a lot of small birds exposed for sale in the Plymouth market, I was much pleased to find among them two specimens of the Tree Sparrow, (*Fringilla montana*,) never having before observed the species in Devonshire. I ascertained they had been killed, with other small birds, on a farm in the neighbourhood.—JOHN GATCOMBE, Wyndham Place, Plymouth, March 28th., 1857.

Common Bittern.—A fine specimen of this bird was captured alive some months ago on the banks of the Isis, just below Abingdon. The bird had gorged itself with fish to such an extent as to be unable to fly, which, on being taken, it immediately disgorged. It is in the possession of a bird-stuffer in that town, who has kept it with considerable care, and has succeeded in partially taming it.—J. C. THYNNE, St. Peter's College, Radley, March 30th., 1857.

The First Egg.—I find among my notes for March, 1853, the following:—"23rd.—In 'spite of wind and weather,' a pair of Hedge Sparrows seemed to have resolved upon being first in having a home; hence through their rashness I became this morning possessed of my first egg, taken from their nest. It may appear cruel to rob them of their first pledge, but surely the frosts and snows now prevalent would have destroyed it. The hedge in which they had built had a north-east aspect, and in some parts was deeply imbedded in snow-drifts." In 1854, my first egg was a Hedge Sparrow's, secured on March 31st.: these occurrences were in Norfolk. My first egg of the present year was, singularly, a Hedge Sparrow's, date March 30th. This is the only instance I have known of this bird's nesting in Birmingham, for till this season it has not been a visitor at the Elms.—G. R. TWINN, April 6th., 1857.

TO THE EDITOR OF "THE NATURALIST."

ACCIDENT has just made me acquainted with your pleasing publication; and though I have no scientific knowledge whatever of any of the "ologies" that make up the distinct components of natural history, I can read a publication like yours with much the same pleasure I feel in rambling through the fields and the woods. As a mere testimony of my good will, I send you an account of a curious incident in my peripatetic observances.—Wandering one Sunday evening in the neighbourhood of Geneva, I saw something moving in the grass; on looking more nearly I discovered two insects of the beetle tribe employed, the one pulling after

it by the two hinder, and the other pushing before it by the two foremost of its six legs, a ball of vegetable and earthy matter, resembling one of the forced meat balls in soup. After they had moved it two or three inches they stopped, as if to rest, still retaining their position, till the hinder one, seeming to think the other was lazy, crawled over the ball and tapped his fellow-labourer on the back, as much as to say "come, pull on, keep moving." Resuming his position, they then proceeded as before, till I touched them, when they let go their hold, and remained for a minute or so quiet as death. After that they resumed their positions, and renewed their operations.—G. WIGHTWICK.

Review.

The Natural History Review. April, 1856, Part X. Price 2s. 6d.
London: WILLIAMS AND NORGATE. Dublin: HODGES AND SMITH. Edinburgh: WILLIAMS AND NORGATE.

THE following are the contents of the above part of this Review:—

Review 1.—"Popular History of Birds." By A. White. 2.—"Popular British Conchology." By G. B. Sowerby. 3.—"Popular British Entomology." By M. E. Catlow. 4.—"Popular History of British Zoophytes." By the Rev. Dr. Landsborough. 5.—"March Winds and April Showers." By "Acheta." 6.—"May Flowers." By "Acheta." 7.—"Handbook to the Marine Aquarium." By P. H. Gosse. 8.—"Contributions to the Natural History of Labuan and Borneo." By J. Motley and L. L. Dillwyn. 9.—"Zetterstedt, Diptera Scandinaviæ." 10.—"Stenhammer, Copromyzinæ Scandinaviæ." 11.—"Hinrich, das Leben in der Natur." 12.—"Structure of Victoria Regia." By G. Lawson.

Miscellaneous Notices.

ORIGINAL COMMUNICATIONS MADE TO VARIOUS SOCIETIES.

I.—"Ova of Hylus." By Dr. Lamprey.

II.—"Larvæ infesting the Horns of Oreas Capna, etc." By A. H. Haliday, Esq., (with a plate.)

III.—"Occurrence of the *Uria Lachrymans* in Ireland." By A. Carter, Esq., M.D.

IV.—"Letter from Dr. Kinahan, dated Callao, August, 1855."

V.—"Occurrence of Rare Birds in Ireland." By Dr. Burkitt.

VI.—"On the Veddahs of Ceylon." By Dr. Lamprey, (with a plate.)
(A very interesting Ethnological paper.—F. O. M.)

VII.—"Celtic Names of the Water Newt." By J. O'Mahony, Esq., A.B.

VIII.—"Extracts from my Diary." By Captain M'Clintock, R.N.,
(with a plate.)

IX.—“Report of Journal of Dublin Natural History Society, 1855.”
And notices of the Serials of Germany, France, and Britain.

The Querist.

In reference to your query in “The Naturalist,” vol. vii., page 40, touching the setting of *Hymenoptera*, I may mention that one of the most extensive (if not the most extensive) collections of British *Hymenoptera* I have seen was chiefly unset.* The specimens in this condition, though not so easily depicted, are, to a great extent, as available for all scientific purposes. It is not desirable, indeed, that the wings should be erect and applied to each other, as this both obscures the venation and hides the abdomen in part. If in a drooping or partly horizontal and divaricated position, this objection is done away. If the insect is merely pinned, and so stuck into a box, the former will very often be the case; but without the trouble involved in what is understood by setting—symmetry and horizontal expansion of wings, etc., a very little pains will make very useful specimens. The subsequent position is determined chiefly by the pressure of the horny scales which protect the base of the fore wings, and the tension of the muscles which produce this. If, before the insect is stiff, whether pinned or not, a pair of forceps (callipers) with slender ends be passed from above downwards, (and slanting a little forwards in general,) so close to the sides that they may catch and raise these base-covers; and having thus embraced from above the base of the wing, they be slightly pressed together, so as to compress the thorax gently at that point, the wings will usually take and keep a drooping position. This process is often necessary previous to setting specimens. Let me add for Lepidopterists who may preserve the parasitic *Hymenoptera* reared in the breeding-cages, (with notes of the Lepidoptera from which obtained—a very desirable means of information,) and others unaccustomed to handling *Hymenoptera*, that they should be transfixed with pins comparatively fine and long; the body of the insect brought up to the middle of the pin, or even higher, taking care that they do not go through the scutellum, but through the preceding ampler field of thorax—or if there be many specimens, in some through the thorax from side to side, as the sculpture both of back and sides is sometimes to be attended to. To prevent the legs of insects not set from hanging down too much, and so getting broken against the cork, I often pass the pin through a piece of stout paper, and bring this up some way toward the body of the insect so as to serve for a guard, which can be easily and safely removed with nippers when the specimen is stiff.—A. H. HALIDAY, Dublin, February 4th., 1857.

* I think every insect should be set.—F. O. MORRIS.



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JULY, 1857.

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Member of the Ashmolean Society, etc.

Author of "A History of British Birds," "A History of British Butterflies,"

"A History of the Nests and Eggs of British Birds."

"A Bible Natural History." "A Book of Natural History," etc., etc., etc.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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NOTICES TO CORRESPONDENTS.

Communications have been received from the Rev. R. P. ALINGTON;—W. DAVIS, Esq.;—J. GATCOMBE, Esq.;—O. S. ROUND, Esq., (three);—F. M. BURTON, Esq.;—G. WIGHTWICK, Esq.;—W. P.—A. B., from Cirencester;—MR. C. E. SMITH;—G. R. TWINN, Esq. The moths sent by an anonymous correspondent are the Buff Tip, (*Pygæra bucephala*.) It is a common species.

Communications, Drawings, Advertisements, etc., to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York;—Books for Review and Parcels, to the care of Messrs. GROOMBRIDGE, 5, Paternoster Row, London.

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SYMPATHY BETWEEN MAN AND ANIMALS.

BY T. FULLER, ESQ.



IN "The Naturalist" for March, Mr. Round has drawn attention to this subject. To persons familiar with animals no feature in physiology is so full of interest, and with minds inclining to thoughts in this direction there is no lack of incidents abounding with pleasing reflections. Numerous instances have come within my knowledge, especially with horses and dogs, and having remarked a decided difference in the character of the sympathy as respects these two animals, I am induced to trouble the readers of "The Naturalist" with the following observations:—

The sympathy of the dog is of a higher order than that of the horse; he is the friend and companion of man, for whose society he forsakes that of his own species. Who has not observed the devotion manifested by the dog to his owner? With eyes intent upon, and following every motion of his beloved master, he seeks to attract attention, and is overjoyed at the slightest notice. I have frequently seen sportsmen enjoying themselves at the fireside after a day's exertion, their dogs lying at their feet to all appearance asleep; but it is soon seen as the events of the day are talked over, that the animals are awake and in deep sympathy with their masters. When a dog's name is mentioned he pricks up his ears and is all attention; if in connection with a fault he shrinks from the censure; if in commendation, the wagging of his tail expresses the pleasure he feels. He is never so happy as when in his master's company, and if not admitted inside the house, he seeks a spot affording a view of the room occupied by his master, and crouched upon the ground, gazes intently upon the window, hoping for a sight of the object of his affection.

This attachment is common to all dogs, and marks the character of their sympathy with man. Much has been written on the subject, and instances mixed with sagacity and intelligence are constantly coming under our notice. What can be more strikingly illustrative than a fact of common occurrence with sheep-dogs, upon those extensive down lands in Wiltshire, so well known by the name of *Salisbury Plain*. Flocks of sheep, numbering hundreds in each flock, pasture during the day over these wide-spread downs. Towards night each shepherd collects his flock to conduct them to the fold. If during the day, as frequently happens, a sheep has wandered so far as to join another flock, the practised eye of the shepherd quickly discovers the loss, and looking to his dog, says in his Wiltshire dialect, *Go and wind un*. Off starts the dog, scents around, determines without hesitation the road towards the flock in which the tenant has herded, soon overtakes it, dashes among the herd, singles out the lost sheep, brings him

safely home, and resumes his situation in attendance, ready for further service.

Here is an amount of instinct and sagacity difficult to comprehend, but such is the fact, and when taken in connection with the attachment of the animal to his master, it accounts for an obedience and docility observable in no other animal.

The horse, in sympathy with man, shews less of these feelings of attachment and obedience; he is more capricious in temper. Some are irreclaimably vicious or stubborn, some bold and courageous, others timid and shy; some impetuous, others impassive; some obedient and confiding, with a degree of attachment; others sly, and ready to seize every opportunity to do mischief. Sympathy between the horse and rider is common, especially when both are under the influence of excitement and a similar spirit and determination mutually prevails; but if the rider falls, sympathy as regards the horse is at an end; the animal goes on, if in chase he joins it, if on a journey and the rider falls from illness or other causes, he forsakes him, however long their acquaintance might have been.

The dog on such an occasion never deserts his master; if he moves at all it is for assistance, and will not cease his exertions until he has brought help to the spot. The horse has sagacity to find his way home, and will perhaps cunningly open the stable door and help himself to food, but shews no attachment or feeling for his lost master. Among many instances of intelligence in the horse now crowding on my recollection, the following is perhaps as illustrative as any:—

A friend of mine, resident in this city, has an estate in Gloucestershire, some thirty miles distant. Before the construction of railways it was his custom to visit this estate frequently, using the same horse. Upon these occasions the horse was fed at an inn about mid-way, and allowed a certain time for rest, during which he had always two feeds of oats; this system of feeding and resting was so well understood by the ostler, that my friend did not think it necessary to repeat his directions, and always found his horse ready to start at the expiration of the regular interval. It once happened that the regular ostler was called away after giving the horse his first feed; and the usual time for resuming the journey having arrived, the carriage was summoned to the door. My friend takes his seat and the reins, Boniface makes his accustomed bow, which is acknowledged with the usual courtesy; but the horse, instead of bounding off as expected, places his fore-legs forward, and fixes himself immoveable in the breeching; the ostler was ready for coercion, and the driver was desired to apply the thong. "No," says my friend, "there must be something wrong here," and descending from the vehicle, patted the horse, but without producing any good effect; his ears continued to be turned backwards with evident symp-

toms of resistance, when it occurred to my friend to inquire how often the animal had been fed;—"once," replied the man acting for the ostler. "Oh! then the mystery is explained; take him out immediately and give him the other feed," which having been done, the horse was again put to the carriage, and started off with all gaiety.

Notwithstanding all the advantages of railway travelling, I cannot from old associations help feeling some regret upon our gradual estrangement from that noble animal the horse; instead of being mixed up, as was formerly the case, with all our means of locomotion, we now only see him in the cab or omnibus, a mere animated machine, fettered by harness and blinkered, driven through his short existence, and slaughtered immediately accident or disease impairs his physical powers or suggests the cost of cure to exceed his working value.

Weston Road, Bath.

BIRDS' NESTS.

BY O. S. ROUND, ESQ.

(Continued from page 131.)

THE Swallow tribe are divided into two methods, for the Martin and Swallow build one way, the Sand Martin and Swift another. The first, everybody knows the mud spherical nest of, as it is stuck under the porch or window-sill. The next is almost as well known, sometimes perched as it is in chimneys, in barn-roofs, or the faces of cliffs, formed of mud and straw, or bits of grass, lined with feathers, and containing its four or five elegantly taper-shaped carnation-speckled eggs. On the other hand, the Swift and Sand Martin are very careless architects, indeed it is pretty certain that the Swift collects all its materials on the way, so that he has not much choice, and is content with such feathers and hay as he takes in this manner. The Bank Martin uses the same materials, but is so secure at the end of his subterranean retreat, that he needs little nest, for in such a situation he must be almost uncomfortably warm, from the closeness. Both these lay white eggs, the Swift only two, and seldom producing a second brood, the Bank Martin usually bringing out two broods of some half-dozen each.

The Finches have a great similarity in constructing their nests; these are all open, and placed on trees or shrubs. The Chaffinch, I think, is the neatest hand of any; his nest, with its white moss covering and interior of hair, is really a charming object, and the pale green eggs, with their purple markings, assimilate very well with it; they have very tender shells, and are easily broken; he is very shy, and soon forsakes. The Greenfinch

is not nearly so fearful, but will sit very close; and cock and hen take it by turns. He uses green moss, lines with roots, and his eggs are reddish-speckled. The Goldfinch is very similar, but smaller and more delicate. Bullfinches also build somewhat in the same manner, but are more careless, and do not breed universally with us, frequenting colder latitudes in summer.

The Buntings are careful architects, and although they do not cover in their nests, take care to have generally a good natural arch of sedge-grass or heath above it. The Yellow Bunting's eggs are exceedingly pretty, marked with purple as if with a fine pen; these markings have been likened to writing, they more resemble, indeed, scribbling than anything else. He uses, in common with the Brown Bunting, grasses mixed with a little mud to give it consistency, and builds on the ground, but the eggs of the Common Bunting are a dull brown mottled.

All the Larks build on the ground, and have open nests, form their structures of grasses and horse or cow-hair, and lay four or five eggs very similar to the Buntings, but smaller; there is only one exception, and that is the Tree-lark, (*Alauda arborea*,) which is best known by its rising to a small height singing, and descending with outspread wings on the topmost branches—a sort of humble imitation of the Sky-lark, as Mr. Bewick aptly expresses it. The eggs of this bird are deep chocolate-colour, and he often builds in a thick furze brake or other herbage, and when put off the nest will counterfeit lameness for the purpose of enticing you from his retreat.

The little Hedge Sparrow's nest almost every one knows, with its bright blue eggs. He generally places it in a bush, hedge, or faggot-stack; it is very neatly made with green moss, and lined with hair. This is usually the victim selected by the Cuckoo for foisting off his eggs upon, so unnaturally neglected; this is the more singular as the egg of the Cuckoo, although scarcely bigger than that of a small bird, is different in colour from the Hedge Sparrow's, being light brown-speckled, that we might suppose it would be immediately discarded, but this is never the case in healthy districts. The Common Bunting and Tit-lark also come in for this foster-parental duty.

All the summer birds, of course, build much later than our own, their nesting-time varying from the middle of April till July. Thus the Black-cap, Whitethroats, and Nightingales have broods in June. The two former have the same manner of constructing a sort of basket-work nest, very deep, and more or less transparent, in some low shrub, the latter in a furze brake usually a little above the ground. The Black-cap's eggs very much resemble the House Sparrow's, white with black specks very delicately marked; the Whitethroat's are merely brown mottled. Many birds are very fond of the same situation, for we constantly find Linnets building in them, and both the Stonechat and Whinchat do the same, whilst the

Wheatear, which so much resembles them, goes underground in rough fallows, and, like all birds who have this habit, uses very little skill in making his house, but deposits his six light grey eggs in the midst of loose sedge, and a few feathers occasionally. The Chats are very secret in their proceedings, and have a long passage underneath the herbage; their eggs are likewise bluish, with dark ends.

The Linnet's nest I look upon as one of the prettiest possible objects; it is very often built on the top of a tuft of herbage, with the overhanging branch of some small tree to shadow and protect it; it is of a size suited to so small a bird, and rather shallow, formed of a mass of roots, small grasses, and moss, and lined with wool; the dark, elegant, and unstudied outline forms a kind of fringe of moss, next the white interior, and with the dear little red-speckled delicate eggs, makes quite a picture. The first I ever saw, I well remember, struck me with great admiration, and I have never forgotten it.

There are many birds, including the Woodpeckers, which take holes in trees or buildings for their nesting-places; most of these are of the order of Creepers, such as the common Tree Creeper, Nuthatch, or Blue Creeper, the Wryneck or Pea-bird, etc., all the Woodpeckers, and these, with one exception—the Nuthatch—lay white eggs and use light materials, such as roots, moss, down, and feathers, for their nests, which, from their guarded position, only require to be a protection for the eggs against the hard parts of the tree; hollows in trees, however, generally contain a bed of natural chips and dust, the work of time, from the internal decay, and insects which have made the crannies their habitation. These are generally formed first by the breaking or cutting off of some branch near the body, or a natural exterior defect; this becomes a receptacle of moisture, which rots the surrounding wood, and in the course of years eats deeply into the tree, sometimes to a great depth before it becomes a cavity. Such defective trees are eagerly sought for by Woodpeckers, who, although they possess (considering their powers) wonderful methods of boring, seldom attack wood in which there is not some latent defect. The holes which they bore are very curious, and as regular as if made by a large augur or centre-bit, and so small for the size of the bird, that it is a matter of wonder how he obtains ingress.

Besides the Creepers, there are several birds which build in hollow trees; thus the Common Flycatcher, the Redbreast, the Starling, the Owl, and even some of the Hawks, use such situations. The Flycatcher builds rather a careless nest of roots, chiefly mixed with wool and lichens, and lays five or six dull red-speckled eggs; her usual place for building, however, is a part of some out-building, or cornices, porches, creepers, or houses. The Redbreast usually builds on the ground, that is, in some bank or heap of

rubbish, from which she collects moss, roots, and dead leaves, and has a pretty snug nest, with five or six largish-sized eggs of a rust-colour. The Starling will take any hole that comes to hand, and, with Jackdaws, lays its blue eggs in old castle-tunnels, church-steeples, and such places. Hawks usually build in trees, but some of the Buzzards on the ground, and almost all the Eagles in rocky cliffs, which are, indeed, a kind of ornithological nursery for Pigeons, Choughs, and the majority of the Cormorants, Gannets, and Gulls; besides, Jackdaws, Grey Crows, and even Swallows infest them. In the breeding-season birds purely marine, and which make no great figure in flying, choose the most convenient situations which they can come at, and their powers of locomotion on the water supply them with the means of rendering these sufficiently inaccessible. All sea-birds generally have their nests in a sort of societies or colonies, and swarm in such numbers as to exceed conception; thus the Gannets are so numerous on the Scotch coast, that a small island called Bass Rock is rented at a considerable sum annually, merely for the eggs and young of these birds, which assemble there in the spring and summer in countless myriads. To attempt any particular description of the eggs and mode of nesting of these tribes, would carry me to an extent sufficient to weary both my own patience and much more that of my readers; suffice it to say they use very little art or material in their construction, marine grasses being the chief materials, lined with feathers from their own breasts; for all water-birds are provided with a large clothing of down, probably partly for this very purpose. Their eggs are extremely various, white, speckled with various hues, grey or green.

The Duck tribe use the materials above-mentioned almost without exception, and place their nests in the midst of the thick aights or reedy islands which abound in large tracts of fen, or on the edges of extensive waters. The eggs of all these are white, partaking of a blue or greenish tint.

(To be continued.)

WHAT ARE THEY FOR?

BY G. R. TWINN, ESQ.

THE marvels revealed by the study of Natural History, cannot fail to excite in the thoughtful, sensations of admiration and praise to the Great wonder-working God. The many contrivances He has bestowed on the very lowest orders of life, for their general harmony, are as equally worthy of our grateful regard, as the complex machinery of that being who is "fearfully and wonderfully made." To a superficial observer of Nature's great museum, some of the most interesting objects are unknown and perfectly foreign; and whenever he may hear of them by means of

lectures, readings, or conversations, he, not being able at once to comprehend and appreciate the Almighty's agencies, as displayed in these formations, crudely asks, "What are they for?"

Eliza Cook has written one of her poems to show that nothing is formed in vain, though we may not individually perceive its uses, and this is a great fact.

Kingsley remarks in "Two Years Ago," "The little zoophyte lives by the same laws as you and I. He, and the sea-weeds, and so forth, teach us doctors certain little rules concerning life and death, which you will have a chance soon of seeing at work, on the most grand, and poetical, and indeed altogether tragic scale. When the cholera comes here, as it will at its present pace before the end of the summer, then I shall have the zoophytes rising up in judgment against me, if I have not profited by a leaf out of their book."

Again, what extensive grounds the naturalist has for study among the electrical forces of nature, both the vegetable and animal kingdoms affording, under peculiar conditions, abundant displays of electricity. Experiments made by Pouillet showed, that in the process of germination, no electricity was evolved by seeds, but when sprouting commenced, "a gold-leaf electrometer had its leaves separated at least half-an-inch."

The heat evolved from an insect has been known to deflect a galvanometer, and the entrance of heated persons into a room has operated in a similar manner; for it is a common truth, that the influences of light and heat, concordant with a strong play of the body's functions, (with its chemical changes also favourably operating,) conduce to give forth electrical discharges. The warm heart of a kitten, after death, is capable of contractile movements, on being touched with a needle, I believe.

The electrical currents in animals are all dependant on the muscles and the nerves, which have a cognate, electro-excitve power, with the muscles.

The class of fishes that can accumulate electricity, and discharge it, with an effect most similar to that given from a Leyden jar, has excited much attention. Nor do I think the interest is altogether extinct; for scientific men, in their labours, find much in Thermal and Voltaic electricity to unravel, that exact results and causes may be given as to the origin of this power, possessed by the Gymnotus, Torpedo, and others.

"The nerves must be regarded as the very essence of being of all creatures," and doubtless as further research prosecutes its enquiry, new facts of electrical wonders, the connection with many organized bodies will be made known, and as the truths are enunciated to the superficial observer, he may repeat the question, "What are they for?"

The answer is, to show the unity of the Great Creator's works, that between the lowliest zoophyte and the highest human organization there

is a connection, as remarkable for its uniformity throughout the series, as for its being a proof that nothing is in vain, nor could any part of the scale be removed without a serious detriment to the whole.

Birmingham, March 20th., 1857.

ON UNITY OF SYSTEM.

(Continued from page 134.)

It has been said with reference to other matters, that a curse attends a standing still in them, and this remark is especially applicable to the word of God, a true knowledge of which is particularly mentioned as an inward growth, and should be ever progressive. In the sciences of astronomy and chemistry the laws ordained by 'God in Nature have been gradually separated by continual study from the errors of astrology and alchemy; so also the Bible is beginning to be free from the tenfold quantity of extraneous matter which has obstructed the knowledge of it. The science of astronomy, as will be noticed in the sequel, helps us to understand under what a totally different aspect creation will appear in the future state of those to whom all things are promised; and also helps to show why all previous knowledge must end with this life. In like manner science, when it has dissipated the illusions of previous fancy, opens a far wider scope for the imagination.

The Bible comprehends very numerous and various examples of periods beginning with degradation or renunciation, followed by a term of probation, like the time of cessation, or of night in the epochs of creation, and ending in the attainment of a much better state than that which was renounced. The first chapter of Genesis contains the outlines of Geology, and commences with ages very far more remote than any which have been disclosed by that science. The six great epochs of creation are mentioned as six days, the seventh still continuing, and one day, as that period is commonly understood, having been appointed to commemorate it. The term day has five different applications in the beginning of the Bible; the first is opposition to darkness, the second as the term for each of the six epochs, the third in opposition to the night, or twelve hours, the fourth as comprising a day and a night, or twenty-four hours, the fifth as the six epochs, or the whole period of creation.

The whole period comprises two great epochs, each mentioned as three days, each commencing with light, and each third day comprising two acts of creation, of which the second is quite different from any preceding one, and indicates a future creation. And in like manner there have been in each epoch some creatures which do not so properly belong to it as to

the succeeding one. The latter part of the third day is characterized by the appearance of vegetation, which takes up or assimilates inorganic matter. The second great epoch was occupied by the successive creations of animal life, which is to vegetation what the latter is to the earth. The latter part of the sixth day contains the creation of man, for whom all the previous creation was preparatory, and who himself is preparatory for a future existence, in which all things will be new; and such, it is said, is the order of creation, not only in the earth, but in every other sphere.

There having been no work, that is, no new being having been created, and no great change having occurred on the earth's surface since the creation of man, the seventh epoch still continues, and when compared to the six preceding periods, is, in the person of man, a progressive separation from the earth, and represents a future existence. A more particular separation appears by man being placed in the garden of Eden, as distinguished from the rest of the earth, and representing another existence, which is still more especially typified by the tree of life; so also the tree of knowledge of good and evil, is figurative of the present epoch and of its enjoyments, without reference to the next, and it appears at the close of the third chapter of Genesis, that the possession of both is incompatible, or that the two epochs cannot co-exist. "The tree of knowledge is not that of life."

In the second chapter of Genesis it appears that the plan of the Bible is in unity with the System of Nature, for successive ages and epochs accord in Nature with the form and growth of a single creature, and in the Bible with the relation of a single circumstance or event. That passage discloses or prefigures the death of Christ, and the eternal life of those to whom His Spirit is given, and their unity and equality with Him. The epoch which commenced here was closed by the deluge, and the present epoch which began at the Crucifixion, is ordained to have a corresponding end, which will be mentioned in the sequel.

The third chapter of Genesis announces a period which began at that time, and though partially ceasing when Christ was on the earth, will not be fulfilled until some future time. It relates man's exalting himself, and his consequent unfitness for, and exclusion from eternal happiness, or the tree of life, but the way to it was then promised, and afterwards disclosed in Christ, to be again generally forfeited, as was foretold by Him and His apostles. Thus the time from the event mentioned in that chapter to the close of the present epoch is but one illustration of the law of degradation, already mentioned as universal, that is, the higher the degree of every creature or assemblage of creatures in each epoch of mortality, the greater is its difference from those of the succeeding epoch; the humility which was outward in all preceding periods becoming inward

in that of man. The fourth chapter contains an instance of the growth of evil, and the consequent exclusion from a better state; and the fifth, a renunciation of the present existence, or means for that better state, or true end. These two examples are figurative of the ultimate division of the human race.

Rocks and mountains are comparatively everlasting, their duration not being limited to thousands, or to hundreds of thousands of years, and the end being indefinite; and so, too, a tree, when it exists for six thousand years or upwards, is, as it were, everlasting when compared with an animal, the former being to the latter as means to an end. The end of man was not declared when he was created, but by the change before noticed his existence was limited, and ordained as the means to an end, the former being still of great length. But after the deluge the means were shortened, and in the time of Moses were limited to the present general duration. The evil in the world is generally occasioned by regarding, using, developing, or exalting the means as an end; this process being wholly opposed to the universal law by which the means are successively shortened, diminished, and degraded, and finally disappear in the end.

The second epoch of the existence of man was now about to come to an end, and its conclusion prefigures that of the great epoch, or of the seventh day, or of the whole time of man upon earth, and is a warning to man that sin, or the usage of this world or of anything in it as an end and not as a means to the next world, will cut him off from all gratification, all sin ending in a severance between this period and that of eternal happiness.

(To be continued.)

FISH NOTES.

BY W.

"Blessings on the fishing-boat."

Tadpole Fish, (*Raniceps trifurcatus*.)—On December 5th., 1856, a small specimen of this rarity was taken, by hook, off Macduff, in twenty fathoms of water, on rocky bottom.

Pogge, (*Aspidophorus Europæus*.)—A somewhat mutilated individual was taken from a haddock's stomach, on January 12th. The haddock was caught about four miles off, on muddy bottom.

Sandy Ray, (*Raia spinosa*.)—This Ray has not been previously noticed in the Moray Frith. Fortunately one made its *debut* on January 17th., and produced a great sensation, at least as far as regards the water. What a joy in the finding and indentifying of every new specimen!

"The sweetest hours that e'er I spend,
Are spent among the" fishes, "O."

The present specimen measured two feet one inch in length, the tail making up one foot, and one foot two inches in breadth. Round one eye was a crescent of twelve strong spines, and round the other one of eleven. At the distance of one and five-eighths of an inch behind the eye, was a triangle of spines in seven rows, five spines in three rows, and three in the others. The first spine of the rows on either side of the middle row began opposite the second of the middle. Nearly in the same line with the outermost rows of the triangle, but a little behind them, were two rows of spines, small at first, but increasing in size towards and along the tail, running along the back and tail to the dorsal fins, at the tip of the tail. Between the rows was a deep depression, and outside each was another irregular row, running also to the tip of the tail. On the lower edges of the tail were rows of closely-set small spines, overlapped by a thin membrane, that increased in breadth as it reached the end of the tail. On the snout were also some spines. The upper surface when taken alive from the boat, was a light greenish grey. On either side of the triangular space of spines, at the distance of one and five-eighths of an inch, was a round white spot variegated with black. The under side was white. It was caught by hook, in fifty fathoms of water,* on stony bottom. When taken into the boat, it curled itself into a circular shape. Its stomach was empty. This description is somewhat different from that given in Yarrell's "British Fishes," vol. ii, page 576.

Shagreen Ray, (*Raia fullonica*.)—This, another stranger in the Frith, made its appearance on the boards, on February 6th. Its total length was two feet eight and a half inches, the tail measuring one foot five inches, and its breadth was one foot two and a half inches. The distance from the tip of the snout to the eye, was four inches and an eighth; and the breadth between the eyes was an inch and a quarter. On the snout were a few spines; round the eyes were crescents of nine or ten spines. A little behind the eyes, on the centre of the back, was a row of four spines; and at the distance of four inches behind it began two rows of spines, that ran along, increasing in size, to the dorsal fins on the tip of the tail. Along the lower edges of the tail ran two rows of small closely-set spines, partly covered by a thin membrane. The skin was very rough round the snout, and along the outer edges of the fins: the under-side was white. The mouth was three inches wide, and placed four and a half inches from the tip of the snout. It was taken by hook, in about thirty fathoms of water. When thrown on the pier from the boat, it threw up its tail and snout almost perpendicularly, and brought up its fins in the same way, so that it formed itself into something like a basin. On the

eyes of skate I have observed a beautiful yellowish fringed membrane, which they have the power of drawing up below the orbit, and spreading over the whole of the eye at pleasure. No doubt this is a wise provision for protecting the eye.

Montagu's Sucking Fish, (*Liparis Montagu*).—On the same day one of these was taken from a haddock's stomach, that was caught in thirty fathoms of water, with rocky bottom.

Starry Ray, (*Raja radiata*).—On the 10th. of February, a fine male was hooked in fifty fathoms on muddy bottom. It measured one foot four inches in length, and ten inches and a quarter in breadth. This species, like the two other, contracts itself into a basin-shape, when taken from the water.

Macduff, February 23rd., 1857.

UNEXPECTED ARRIVALS.

ON the 22nd. of September, 1843, on board the good ship General Hewitt, bound for Sydney, we were visited by several land-birds. I am sorry to find that I have not noted the exact position of the vessel on that day, but only that we were about three degrees north of the equator.

However, from the track usually followed by outward-bound vessels, we must have been several hundred miles distant from the land. We had experienced heavy gales of wind accompanied with drizzling rain and fogs for two or three days previously. Early in the morning a pair of Herons came slowly flapping along, and perched on the rigging; they were so exhausted as to allow themselves to be caught with the hand. After these a bird flew several times round the ship in sight of the passengers, who pronounced it to be a Woodcock, but as it did not alight we could not be certain. Towards the afternoon arrived four Swallows, (*Hirundines urbis*;) and two Water Wagtails. They all seemed very tired, and flew with wearied wing. They remained with us all that day, and perched at night on the ropes of the ship close together.

The next morning one of the Herons was found dead, and as its companion refused to eat, we gave it its liberty, and away it flew; but it had not strength to go far, and we saw it fall into the sea, where it doubtless perished. The other little strangers seemed to have quite recovered their health and strength; the Swallows hawked about the deck for flies, and even ventured into the cabin, passing in and out of the doors, and through the port-holes of the cabins. They consisted of two old and two young ones, the latter not having moulted their nestling feathers; from which fact I concluded that they were not on their autumnal migration, but must have been blown off from the land, or lost their way

in the recent fogs. To the best of my belief, no bird migrates until it has completely moulted. As night approached, the Swallows seemed very restless, flying swiftly round the vessel, and occasionally venturing almost out of sight; but, as if their hearts failed them, they returned after an absence of a few minutes. At last they took themselves off, and we saw no more of them.

All our guests had thus left us, except the pair of Wagtails, and the following day one of these disappeared, but the survivor seemed determined to emigrate. In the boat which hung at the vessel's stern a number of cabbages and lettuces had been stowed away when we left England, and had become spoiled and unfit for use; some small flies and insects had bred there, and our little friend soon found them out and made a famous meal off them, and having taken a drink of water at the fowls' coops, began to preen his feathers and make himself quite at home. Of course he became a great favourite, and remained with us until we entered the southern tropic, but I regret to add he fell a prey at last to a prowling cat.

FIRST APPEARANCE OF MIGRATORY BIRDS IN THE NEIGHBOURHOOD OF KILNSEY, IN CRAVEN, YORKSHIRE.

BY EDWARD J. MAUDE, ESQ.

THE village of Kilnsey, which lies in the upper part of the valley of the Wharfe, and a mountain limestone district, is six hundred feet above the level of the sea, and the moors in the neighbourhood range from one thousand to two thousand three hundred feet high, but all the following first appearances occurred between the level of six hundred and a thousand feet. Swallows and Wagtails, (yellow and grey,) make their appearance there considerably later than stated in Morris's "British Birds," which may be accounted for by the great elevation of the district, but it is rather remarkable that the Common Sandpiper should arrive so much earlier than the usual average.

Black-headed Bunting,		March 19th., 1857.
Ring Ouzel,		" 21st., "
Wheatear,	March 28th., 1856.	" 23rd., "
Common Sandpiper,		April 1st., "
Chimney Swallows,	April 21st., "	" 13th., "
House Martin,	" " "	" 16th., "
Redstart,	" " "	" 16th., "
Yellow Wagtail,	" 22nd., "	" 18th., "
Grey Wagtail,		" 22nd., "
Cuckoo,	" 18th., "	" 27th., "

Those beautiful little creatures the Wheatear and Pied Wagtails are very numerous, the limestone walls furnishing them with continuous perching places, on which they are constantly displaying their graceful movements.

The Old Hall, Knostrop, Leeds.

THE MISTLETOE, (*VISCUM ALBUM*.)

BY J. MCINTOSH, ESQ.

AT page 154 to 158 of vol. i, of "The Naturalist," we have recorded some interesting notes on this singular parasite. We would now beg to draw the attention of our readers to the etymology of the word Mistletoe, which we extract from "Willis's Current Notes of the Month," by the Rev. T. R. Brown, who writes as follows:—

"The Saxon is *Mis-tel-ta*, the signification of which cannot be ascertained in that language. By taking away the verbal part *ta*, we have the German, Danish, and Swedish *mis-tal*, the Mistletoe.

The Gaelic name for this plant forms a singular link and clue to its real meaning; it is *uile-ice*, the Mistletoe, the *all-keal*, 'hus sior waine a tharuingeas a bhith o phlannt eile, an evergreen tree that draws its existence from another plant. It evidently refers us to the Saxon *Se Hœland*, the Healer, the Saviour of mankind.

The Saxon *mis-tel-ta* is a compound of three Sanserit words, namely, *Mas*, *Vishnee*, (the Messiah;) *tal*, (a pit, *Metap*, the womb;) and *tu*, (motion, *to or from*;) therefore *Mistalta* comprises the whole of the time from the conception to the birth of our blessed Saviour, and seems to have been subsequently applied to him during his helpless infant state; of this I think I have a proof in a painting of the holy family in my possession, where the top of Joseph's staff is encircled with, I believe, the *Loranthus Europæus* in blossom, (see description of this plant below,) and what seems to be explanatory of the wrong translation of *ta* into *toe*, is, that Mary holds one of the great toes of the infant gracefully between her fore-finger and thumb. Another proof is, if I mistake not, in *Cuperi Harpocrates*, where a peculiar amulet is described in the words of Kercher, '*Capsula est in forma cordis, et fructum foliumque Perseæ mentiens*.' I forbear to comment on the word *cordis*, it is sufficient for my purpose to notice that under the feet of the infant *Horus* or the Messiah, '*labia digito prementem*,' is a plant resembling the *Mistelta*.

The ivy and Mistletoe being *evergreens*, denote everlasting life through faith in the promised Messiah; and its dependence on a *tree* for sustenance, etc., has its mystical meaning, and when found on the king of trees, the oak, would be considered as the most sacred of its kind, and would

typify the dependence upon, and the unsearchable bond existing between God the Father, and the Word.

Kissing under the Mistletoe has now lost its import; its primary meaning is obvious. I believe 'the branch,' Ezekiel viii, 17, refers to the Mistletoe, the *Viscum*, in Virgil, *Æn.* 6, v. 205; but the Hebrew signifies a branch not torn off, nor broken off, but *cut* from the tree."

The above is the substance of the Rev. T. R. Brown's etymology of the word Mistletoe, with which we agree, but beg to observe that kissing under the Mistletoe has not yet lost its importance, for

"I remember, I remember,
We the Mistletoe hung high,
On a cold night in December,
When the Christmas eve drew nigh.

I remember from the ceiling
How its gleaming berries shone
On the pretty girls there squealing
As I kissed them every one!

I remember, I remember,
How the Mistletoe hung high,
On that cold night in December,
And the tale that hangs thereby."

Of the three Mistletoes known to Europe, *Viscum album*, *Loranthus Europæus*, and *Arceuthobium oxycedri*. The *V. album* abundant in England, France, and Germany, is much less so in Italy. The *L. Europæus*, appears to have been Pliny's "Dryas Hyphear," and is found in abundance on the *Quercus Cerris*, or Turkey Oak in Illyria and Italy, with which country Pliny was of course best acquainted, but is not so in France or England, or anywhere north or west of the Alps, and cannot have been the Druids' Mistletoe of this writer. In fact Pliny's account of the Druids' Mistletoe appears to me to have been misunderstood by many botanists, at least I can see nothing in it which is not in accordance with the natural history of *V. album*. They held sacred the tree which produced it, provided it was an oak, but it was exceedingly scarce; therefore, any common species of epiphyte, or any tree on which the Mistletoe is common, will violate the conditions of the case instead of forwarding them. The *V. album* was in such common use for making bird-lime that it ought not to have been the subject of mistakes. I imagine that the passage in Virgil, on the gathering of the one golden branch from the tree of Proserpine, favours the idea of a supply being kept up by artificial culture, though, probably, not avowedly so.

The third kind, *Arceuthobium* (or *Viscum*) *oxycedri*, is occasionally found on conifers in the south of Europe, as well as in north-west America, Mexico, etc., and may have been Pliny's *Stelis*? It is, however, very

difficult at this distance of time, to state with any degree of exact truth which was the plant made use of by the Druids. As it may not be impossible that the ingenious mis-translation of some antiquary may prove to be the only authority of the accounts which have been handed down to us of some, (if not all,) of the purposes to which the Druids applied the Mistletoe.

The Mistletoe is a parasite, which presents all the character of a flowering shrub, but instead of rooting in the ground, has its base naturally grafted upon some living tree, exactly as a scion is grafted upon a stock artificially. It has its rings of wood, like other dicotyledons, and these are formed year by year with those of the branch on which it lives. It has green leaves, and is known to give off oxygen from them, so that it is of a higher character than many other parasites, and performs for itself part of the operations of assimilating the crude nutriment.

In France it is called *Misseldine*; in Germany, *Misti*, or *Missel*; in Italy, *Visco*, or *Vischio*; and in Spain, *Legamodoga*.

Since our article in vol. i. was published, we have found it growing on the *Robinia Pseudacasia*, at Hatch, near Taunton, Somersetshire; and on the same road, about two miles from Taunton, in a large hedge-row may be seen twenty-three apple trees quite covered with this parasite.

The berries have, from a very early period been used as bird-lime, which, Gerard says, is greatly to be preferred to bird-lime made from the holly. They are eaten by the blackbird, fieldfare, and common thrush, as well as by the missel thrush.

As a medicine, the Mistletoe was frequently employed in England as a cure for epilepsy, but it no longer holds a place in the British materia medica.

As we have before stated, we shall feel extremely obliged if any correspondent will record any oak trees on which they have seen this parasite grow.

MIGRATION.

BY O. S. ROUND, ESQ.

IN speaking of our land-birds, those kinds which are only sojourners in this country during the more genial seasons of the year, necessarily demand a large portion of our attention; and as the subject of their annual visit forms the chief feature of their interesting lives, it is one which cannot be passed in silence. The economy of nature in this particular is very remarkable; all those kinds which migrate, or change their residence to other regions at stated times, are formed only to exist in a temperate climate, and cannot sustain the least severity of cold. This has nothing to do with their size and tenderness, for some of our

own indigenous species are the minutest; thus the little Wrens cheer us by their presence during the whole progress of ice and snow, pitiless blasts, and shelterless woods, and, with the Titmice and many others equally weak and helpless, brave the greatest rigours of our climate. Now these are chiefly insectivorous birds; but insect food is very scarce in winter, and although there are some few insects, such as gnats, which are seen at all times, almost when the sun is set, this supply would evidently be totally insufficient for the support of so many individuals, and indeed, in hard winters, is often inadequate for our own native songsters; hence it is wisely provided that as soon as the general supply fails, the bulk of birds that subsist upon it should depart for realms where it is still to be met with. From this it appears that it is chiefly their inability constitutionally to endure our winters, that causes them to migrate, since many of our birds which go through it well enough are insectivorous. All the insect tribes lie concealed in what is called the *pupa* state, or dormant in transition existence, during winter, either in the earth, in the bark of trees, or in other concealed situations. As soon as the sun has attained a sufficient altitude in the heavens to render his beams available, by their reflection, as a medium of heat, a stir takes place amongst these vast armies in ambush, and the woods, the plains, and the waters teem with insect transformations. A great proportion of these deposit their eggs in flesh, which is their proper receptacle, and in which they pass the first stage of their existence, and become maggots; and some, as the green flesh-fly, perform their office on the bodies of living animals. There are also some other larger kinds which bear the name of *Cestrus*, and *Bombylius*, signifying a large bottle with a narrow mouth, which they resemble in shape; these oviposit in particular kinds of cattle, chiefly of the horse and ox kind. There are vast numbers of the *Dipterous* and *Apterous* orders, that is of the fly and flea species, that are blood-suckers, and, in company with the *culex* or gnat kind, are great pests in warm weather; there are some which sting and some which bite, and these form the two great divisions, for very few are perfectly innocuous.

All insects are extraordinarily prolific, and it is therefore manifest that, without some counteracting agency, their presence and numbers would soon become intolerable. This difficulty is met by the migration of the summer birds, the bulk of which subsist chiefly upon insect food, and the greater number of the bulk entirely so. Only consider for a moment what an enormous number of insects must be consumed by the Swallow tribe alone, which are on the wing for thirteen hours per day, during their stay of more than five months at a moderate average, and catching some kind of insect continually, as you may easily presume, if you watch them ever so short a time. This average of actual activity in search of food, I think,

will fairly allow for the time occupied by the hen-birds for incubation, as the summer day is sometimes seventeen hours of direct light, in which a continual stir takes place. Then there are the Willow-wrens, White-throats, Wheatears, Blackcaps, and we know what indefatigable gentlemen the Flycatchers are, all these being purely insectivorous, and the first and last, perpetually in very active search of prey, scarcely still for a moment; and, besides all these, there are our own birds, which, more or less, make it their chief article of food. Only reflect, if it were not for this drain, what myriads of insects would infest every part of our dwellings, our clothes, and furniture; the whole air itself would teem with them, as it does sometimes, even as it is, and we should be as it were eaten up piecemeal. Are not therefore these little feathered creatures extremely useful members of the community? indeed they are, and we must admit that they cheer us by their song, and enliven us by their presence also. As they perform the process of nesting here, their numbers when they depart are increased nearly four-fold at a reasonable computation, more particularly as some have two broods; and yet such is the wonderful balance which is kept in this miraculous scheme of creation, that the difficulties and dangers which they undergo in their journeys to and fro, so lessen their numbers as usually to bring them very near even again; indeed some most accurate natural observers have declared positively that as far as observations went or could go, with regard to particular kinds of summer birds, whose motions were easily watched, the same exact number of pairs returned to the same spots to breed annually. Now is not this astonishing? it may be considered almost a miracle, and yet look at our own bills of mortality, and I think we shall not be able to deny that it is a parallel case.

The ancients had the most singular and improbable notions with regard to the subject of migration, one of which was, that as the winter approached, Swallows went "under water," and there remained in a torpid state until spring. Another was that they hid in hollow trees and the holes and crannies of rocks, and in Stillingfleet's "Swedish Calendar of Flora," published in 1761, there is an entry made by Linnæus himself, thus, "Swallow goes under water!" It is, however, some excuse for our forefathers, that not only was natural science in its infancy, but naturalists of much later periods have been sceptical (I will not say absurd) enough to entertain the same opinion, though in a doubtful manner. This was a particular hobby of Gilbert White's, the Selborne historian, and I believe he died without having satisfied himself; but there have been such decided proofs of actual migration, that no doubt whatever can exist. Mr. Adamson, in his "Voyage to Senegal," says that in October, 1749, European Swallows settled on the rigging of the vessel in which he was, and they are never seen at Senegal or Goree but at that time of the year,

with Wagtails, Quails, Kites, etc., and do not breed there. Now this appears to me a direct proof, or as direct as we can obtain. In Caillie's "Travels to *Timbuctoo*," we find an analogous passage, and the circumstance of Swallows settling on the rigging of ships in all latitudes, is too notorious to need further proof. The other birds of passage are so desultory and uncertain in their movements that it is much more difficult to obtain anything like satisfactory information regarding their transit, but we have sufficient evidence that they make their way by the British Channel, through France, and across the Mediterranean, (probably by Gibraltar, being the narrowest passage,) as it has been observed in Spain that there is an annual flitting of this kind of birds in autumn, through that country towards Africa, many parts of which are quite unknown to us; and may it not be very reasonably supposed, that were we acquainted with those regions, we might meet with many of these truant wanderers.

The sea voyage has often been urged as an insuperable bar to the migration of our weaker summer birds, but, I think, this may be easily answered even supposing that they took an extensive voyage, which I believe they do not. In elucidation of this I will relate a curious circumstance as it was told to me by a gentleman whose veracity I cannot doubt, more particularly as he was no naturalist, and merely mentioned it as a singular thing. "Being at Dover during the autumn he walked daily on the beach, at some distance from the port, for the sake of sea-air and exercise, and one morning seeing a fisherman looking anxiously out to sea, his curiosity was excited, and he enquired what he was gazing at, and to his no small surprise received for answer, 'A covey of birds, sir.' 'A covey of birds!' said my friend in astonishment. 'Aye, sir,' replied the man, 'it is not uncommon when they're shooting inland, for the birds to fly out to sea; and then when they can't fly any further why they just settle, and there they are settled, pointing with his finger. . After a good deal of pointing out, (for there are not a many, or rather too many marks to go by at sea,) the Partridges, or some birds which were said to be Partridges, were certainly seen on the face of the water; a boat was subsequently got and rowed towards them, which my friend watched with some interest; but what was his surprise to see them *rise* from the sea, and take another flight, and another, but from fatigue and wet they were soon taken up alive, and brought to shore, and this, he was informed, was often done."

Now, as my readers may perceive, my reason for introducing this story is to shew that if such a heavy bird as a Partridge, and one which requires such an exertion to raise itself, could be sustained on the surface of the water, and rise from it more than once, how much more could our light fragile summer travellers do so? and supposing the weather fine and calm, which it usually is in October and the beginning of May, (the

time during which they perform their migrations,) they might thus be enabled to fly a few miles, when fatigued to settle, float, rise again, rest again, and so on, for neither birds nor fish are met with on the expanse of the boundless ocean, and these always indicate the vicinity of land to mariners. I only offer these observations as suggestive, and do not pretend to advance them as having a spark of foundation, for I have hardly any doubt that, except the Swallows and such powerful flyers, the mass of migratory birds make the least possible journeying distance over sea, indeed it is quite unnecessary for them to do so. It is also somewhat singular that Gilbert White, who seems to be satisfied of this to a great degree, from the representations of his brother who lived in Andalusia, should fix upon Swallows, most capable of sea-flights, as the only kind that did *not* take them. As to migration never having been regularly observed, it is performed necessarily in such an uncertain manner, from the different circumstances and necessities of the individuals engaged in it, that it would be indeed a surprising thing if it had been.

Besides these migrations to foreign countries, there are others which take place even within the narrow precincts of our own little island, from north to south, westerly or easterly, and so on. These arise from the difference of climate, and consequent state of the earth, which is observable between the different portions of Great Britain, and food is no doubt the chief directing cause in these movements. Of these internal migrations the Whinchat,* the Wagtails, the Pigeons, the Ring Ouzel, and the Snipe, are examples which are always to be found in certain mild districts, whilst in others they are only seen at stated times, and their return regularly expected. The migration of the Ring Ouzel was first brought into public notice by the Rev. Gilbert White, before mentioned; these birds it seems breed on Dartmoor, in Devonshire, and are found throughout the whole year in Scotland, where they do not perform any migration, a somewhat startling anomaly! Whither they depart when they pass eastward in the autumn is not well ascertained, but it is very unlikely that they leave this country. I have seen them on Brighton Downs, in October, and they are very much dispersed over the counties of Hampshire, Surrey, Sussex, and Berkshire, in the early part of October, and as regularly return westward the first week in April, and are very late breeders, as they are *then* only repairing to their nesting places.

In the fourth volume of "The Naturalist," at page 247, I have referred to the circumstance of this migration having been observed before Gilbert White wrote, by an old man who resided at Sunninghill, in Berkshire; and others there have mentioned to me the same circumstance. They were known by them as French Magpies, a name, by the way, also given to

* Stonechat?—F. O. MORRIS.

the Pied Woodpecker,—a singular jumble truly! Snipes and Wagtails are a good deal influenced by weather, and shape their course to milder regions according to its severity, searching out the running streams and sheltered low grounds; and their movements (except the Jack Snipe and Yellow Wagtails, which are regular birds of passage) can hardly deserve the name of migration. This is very much the case with the Wild Pigeon, which can only be said to be migratory in the south of England, where it does not appear in bulk of numbers until deep autumn, and yet they breed very much in any extent of park, and there are many localities very far south which they never desert during the whole year. Windsor great park has vast numbers at all seasons, but in winter the numbers are certainly greatly augmented, and regular flights wing their way, out early and home late, during November and December, in search of food, and probably traverse great distances in these excursions; in fact, if we looked narrowly into the matter, we should doubtless discover many internal migrations which take place among our small native birds, and with which we are at present wholly unacquainted; but this could only be effected by a quick succession of movements to different parts of the country by a careful and competent observer. By this means not only might new migrations be brought to light, but many which are now but imperfectly understood would receive a greater certainty of limit and direction than they at present possess.

It is a beautiful provision of Nature for the preservation of life, that when a time arrives at which the species of food which supports a being fails, he should be endowed with an insuperable desire to travel to other realms, where that sustenance is to be found; this is a generally implanted instinct, and arises naturally in the individual, as has been frequently instanced; for birds of passage, taken from the nest, and upon whom their parents' movements could have consequently had no influence, are seized with a sort of restless anxiety at that particular season, and unless very narrowly watched and sufficiently secured, will make their escape and follow their companions. This has ever been the case with birds that have been in captivity for some years from the nest, and then escaped, having learned several notes from other birds that were kept with them, and which distinguished them from the general chorus in the same vicinity, summer after summer, as the species of birds to which they belonged again returned to us. It certainly binds a great interest to the first appearance of summer birds in May, to reflect on the difficulties and dangers they have encountered, and the immense tracts of earth and ocean they must have traversed to visit us. As numbers continue to drop in, this feeling wears off, but I have often considered, as I have watched them gathering materials for their nest to fulfil the chief object of their visit, how much greater travellers they were than I, and had probably since last with us visited regions in

which European foot never trod. Such is the power of that wonderful instinct, which watches over the preservation of the life in so miraculous a manner, continuing it and sustaining it in an endless succession from the moment of its creation until time itself shall be no more.

Pembroke Square, Kensington, May, 1856.

SYSTEMA NATURÆ.

BY THE REV. F. O MORRIS.

(Continued from page 137.)

RHYZÆNA.

Rhyzæna tetradactyla, *Schinz.* R.
capensis, *Less.* Suricata capensis,
Desm. Viverra suricata, *Erwl.* V.
tetradactyla, *Schreb.* V. Zenik, *Linn.*
Gmel. F. Cuv.

CRYPTOPROCTA.

Cryptoprocta ferox, *Benn.* *Schinz.*

PARADOXURUS.

Paradoxurus typus, *F. Cuv.* *Schinz.*
Viverra nigra, *Desm.* *Gray.* *Fisch.*
Temm.
Paradoxurus Musanga, *Müll.* *Gray.*
Schinz. P. fasciatus, *Ogil.* P. felinus,
Katz. *Wag.* *Schreb.* P. Pallasii,
Hardw. et Gray. P. dubius et hermaphroditus,
Gray. *Temm.* *Viverra* Musanger,
Marsden. V. fasciata, *Desm.*
Paradoxurus leucomystax, *Gray.* *Müll.*
Temm. *Schinz.*
Paradoxurus larvatus, *Schinz.* P. laniger,
Hodg. P. Graji, *Benn.* *Tem.* Gulo larvatus,
Herm. *Smith.* *Viverra* larvata, *Gray.* Paguma larvata,
Gray.
Paradoxurus Bondar, *Gray.* *Schinz.* P. Pennanti,
Gray. P. hirsutus, *Hodg.* *Viverra* Bondar,
Blain.
Paradoxurus trivirgatus, *Temm.* *Schinz.* *Viverra*
trivirgata, *Gray.* *Müll.*
Paradoxurus binotatus, *Schinz.* P. Hamiltonii,
Gray. *Temm.* *Viverra* binotata, *Gray.*

Paradoxurus annulatus, *Wag.* *Schinz.*
Paradoxurus leucopus, *Ogil.* *Schinz.*
Paradoxurus Philippensis, *Schinz.* P. Jourdanii,
Gray. *Temm.*
Paradoxurus nipalensis, *Hodg.* *Schinz.*
Paradoxurus quinque lineatus, *Gray.* *Schinz.*
Paradoxurus musangoides, *Gray.* *Schinz.*
Paradoxurus Nubiæ, *F. Cuv.* *Geoff.* *Schinz.*

CYNOGALE.

Cynogale barbata, *Schinz.* C. Bennetii, *Gray.*
Lamietis carcharias, *Blain.* *Potamophilus* barbatus, *Müll.*

CANIS.

Canis familiaris, *Schinz.*
Canis Dingo, *Schinz.* C. familiaris australasiæ, *Desm.*
Canis novæ Hiberniæ, *Schinz.*
Canis primævus, *Hodg.* *Schinz.*
Canis rutilans, *Mull.* *Schinz.* C. javanicus,
Cuv. *Desm.* C. sumatrensis, *Harw. et Raffl.*
Canis simensis, *Rupp.* *Schinz.*
Canis pictus, *Rupp.* *Desm.* *Schinz.*
Canis Lupus, *Schinz.* etc.
Canis oehropus, *Esch.* *Schinz.*
Canis latrans, *Rich.* *Fisch.* *Schinz.*
Canis mexicanus, *Linn.* *Buff.* *Fisch.* *Schinz.*
Canis hodophilax, *Temm.* *Schinz.*
Canis pallipes, *Sykes.* *Schinz.*
Canis alpinus, *Pallas.* *Schinz.*

Canis jubatus, <i>Desm. Cuv. Schinz.</i> C.	C. aureus, <i>Rupp.</i>
campestris, <i>Prinz Max.</i>	Canis mesomelas, <i>Schreb. Cuv. Desm.</i>
Canis aureus, <i>Linn. Schreb. Cuv. Schinz.</i>	<i>Fisch. Schinz.</i>
Canis anthus, <i>Cretch. F. Cuv. Schinz.</i>	Canis antarcticus, <i>Shaw. Desm. Schinz.</i>
C. lupaster, <i>Ehren.</i>	Canis cancrivorus, <i>Desm. F. Cuv. Schinz.</i>
Canis variegatus, <i>Cretch. Rupp. Schinz.</i>	<i>Viverra cancrivora, Meyer. Fisch.</i>

(To be continued.)

Miscellaneous Notices.

Blackbirds.—As one of the sons of a farmer, at Croole, was going to school on Thursday, he observed in a field two blackbirds fighting. He pulled up to witness the combat, and they at last came so near that he was in the act of raising his cane to strike them, when one of the birds darted at him, and billed him just beneath the eye, causing the blood to flow. The blow was so sudden and unexpected, that it stunned him for the moment; but on looking round, he found the bird laid dead at his feet.—*From the "Birmingham Journal," for April 15th., 1857.*

The Cuckoo.—This bird was heard here on the 17th. of April, but a farmer's boy who brings milk into the city, assures me that he heard him a fortnight before. I should doubt this, but the boy is very intelligent, and I have questioned him closely; he is positive as to the fact. There was a white frost the same morning.—*THOMAS FULLER, Bath, May 11th., 1857.*

Carabus intricatus.—When digging for insects a few days since in the neighbourhood of Plymouth, I had the good fortune to find three fine and perfect specimens of *Carabus intricatus*, and the mutilated remains of a fourth. These insects vary considerably in colour, some being tinged with resplendent blue and violet, whilst others are dull and nearly black.—*JOHN GATCOMBE, Wyndham Place, Plymouth, May 18th., 1857.*

Rara Avis.—A female specimen of the Harlequin Duck, which is perhaps the rarest of all the visitors to our coast, was killed on the 7th. of April, at Maxstoke Castle, near Colleshill, in Warwickshire, by Mr. J. S. Dugdale. It is very rarely the case that birds of this kind stray so far inland. In this instance the Duck had been swimming about with four Canada Geese for four or five days in a pond in Maxstoke Park, and did not even offer to fly when stones were thrown at her. Yarrell only records six instances of specimens of this species being obtained in England. It breeds in Greenland, Iceland, and the most northern parts of the American Continent. The bird is now in the hands of Mr. Franklin, of Birmingham, for preservation.—*"Davenport Journal."* Communicated by Mr. T. FOGGITT.

Proceedings of Societies.

Thirsk Natural History Society.—The quarterly meeting of this Society was held on the evening of Wednesday, May 6th. The following gentlemen were elected officers for the ensuing quarter:—Mr. J. G. Baker, President; Mr. R. D. Carter, Secretary; and Mr. J. J. Paeker, Librarian.

The following additions to the library were announced:—"Hugh Miller's Testimony of the Rocks," and "The Entomologists' Annual," for 1857.

E. D. Swarbreck, Esq., was proposed and duly elected a member. Mr. J. H. Davies exhibited a series of specimens of *Bryum obconicum*-Hornch, and announced the discovery of a new station for it in the neighbourhood of Sawley. He observed that although Mr. Wilson had been led to doubt the distinctness of that species, and seemed inclined to refer it as a variety to *B. capillare*, yet it was found that in this neighbourhood it retained its characteristics from year to year.

Mr. Baker laid before the meeting a series of British and Continental examples of the Sweet Violet and its allies, and remarked respecting them, that a plant which he had gathered in April, by the side of the Ure, near Tanfield, he was inclined to identify with *Viola sepincola* of Jordan, a species new to Britain.

The Querist.



On Birds using oil from Glands.—The May number contains an enquiry from Mr. Waterton, in reference to some observations of mine upon the above subject, which appeared in the "Naturalist," for February last. Had I then known the subject had been disposed of by abler hands you would not have heard anything from me. In compliance now with your injunction to be brief in any reply to Mr. Waterton's questions, I cannot do better than refer that gentleman to the articles mentioned in your notes upon both occasions. Mr Waterton has sarcastically designated me "The learned Naturalist." The pleasure I have received in the perusal of his interesting essays on Natural History amply compensates for the uncourteous epithet, as applied to a tyro like myself.—THOMAS FULLER, 2, Grafton Place, Bath, May 2nd., 1857. (A word from me hereafter.—F. O. MORRIS.)

Would any gentleman favour Mr. Twinn, with information regarding the *Synapta lineata*, and the employment of its anchors? He would consider it a great favour.—G. R. TWINN, May 5th., 1857.

I think I have never before heard the birds sing so little as they have this year. Have any correspondents made a similar remark?—F. O. MORRIS, Nunburnholme Rectory, June 1st., 1857.

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the earth is full of Thy riches.—PSALM civ., 24.

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NOTICES TO CORRESPONDENTS.

Communications have been received from O. S. ROUND, ESQ.;—CAPTAIN J. M. JONES;—DR. FALCONER;—MR. T. ARMSTRONG.

W. A. B. is informed that the Ring Dove and the Wood Pigeon are one and the same species—the Stock Dove a different one. See Morris's "British Birds," Nos. 42 and 43.

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EDITED BY H. G. ADAMS.

Editor of the "Cyclopædia of Poetical Quotations," "Cyclopædia of Sacred Poetical Quotations," etc.

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BEAUTIFUL HARMONY.—
 INSTINCTIVE ACTION OF A BLIND HORSE

BY GEORGE R. TWINN, ESQ.



THE pure eye of the Christian Naturalist, or man of science, never beams with the light of pride; its lustre is caused by the lofty gratification that swells in the heart, and prompts the holiest feelings of gratitude; reverential humility is always characteristic of true knowledge, as is this deep internal joy; resulting from the conscious belief that the mind of the Eternal Creator must know all that He has created; whereas man's mind, being finite, can comprehend only a part of the vast resources so lavishly provided; but with that light of comprehension comes that holy joy. To some mental organizations there is an apparent discrepancy in life, because only a minute part is recognisable; and from this partial knowledge they commit the error of imagining that there is a want of harmony in creation. But what is the ennobling object which science puts before her devotees?—Truth; and to secure this, they strive in faith and earnestness for a glad result to their endeavours; and finding each one in the particular branch of his selection a most beautiful harmony distinguishing it, he argues, by induction and analogy, as needs be, (and rests in perfect faith,) that all, if parts are, is characterized by this law of harmony;—the aggregate studies of others, in various departments, all confirming this view. I was led into these reflections by considering how important a possession instinct is; it is this wondrous gift that leads the young of Mammals to the teats for nourishment; that guides the Swallow in its long migratory journey; that invariably brings each caterpillar to its favourite distinctive food; that thrills through a swarm of ants when a victim is to be secured; that draws together the birds of passage; that impels the salmon in the spawning season; and that is so marvellously exhibited in an endless variety of ways throughout the animal kingdom—in certain instances bearing so approximately upon reason, as to overcome us entirely.

In July, 1856, I travelled on a lovely night along an open country road, in company with a gentleman whose horse was totally blind; our distance to reach home was about five miles, and on either side were many branch-roads and lanes. Surely and safely went our steed, and to convince me of what I had previously been told, the reins were arranged carefully, and all guiding discontinued. Instinctively sure of the correct turn on our right, the animal diverged with all care and took us from the high-road into the lane. No skilled driver with a sound horse could have turned more exactly than the blind creature did without any guidance, and in safety we reached home. This horse was accustomed to open gates, and I saw him do so on several occasions, pushing them forward sharply, when

with his nose he had pressed back the *snatch*. Now many persons will say this and kindred other illustrations prove something more than instinct. I think not. The display of memory, or any other passion of the mind by the lower creatures, argues they have mind like man, but very widely differing in its powers and construction. Man's mind is naturally reflective, but not that of animals, for this is the limit marking instinct and reason most significantly, and bearing evidence of the Creator's high deed of placing them all under man's control. Thus we discover no discrepancy; all is as it was intended to be, and a perfect law of harmony and order is enacted throughout the manifold regions of animal life.

The Elms, Birmingham, April 6th., 1857.

REMARKS UPON THE RINGED GUILLEMOT.

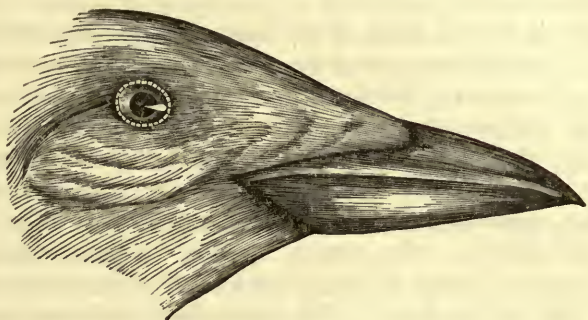
BY ROBERT GRAY, ESQ.

Read before the Natural History Society of Glasgow.

THE history of this bird, whether as a variety of the Common Guillemot, or as a distinct species, appears to be involved in considerable obscurity; any observations which have been yet published about it are certainly far from affording either satisfaction as to its description as a variety, or conviction respecting its identity as a distinct bird. The various authors who have given it a place in their works have been able to say very little about it; hence any ornithologist who wishes information will find on consulting any of them that the account is not only meagre and partial, but in many cases very contradictory. Thus as regards colour, we have the bird described from a mouse-colour to a pure black, and in size from fifteen to nineteen inches as the total length. From this, however, as I shall afterwards observe, we learn the significant fact that in this case neither colour nor size can be relied upon as specific characters.

On a slight comparison of all the specimens on the table before you, it will be seen that the Ringed, or "Bridled" Guillemot, as it has been called, differs from the Common Guillemot *only* in the white line which encircles the eyes, and extends about an inch behind them; but those writers, whom I shall presently quote, appear to attach some importance to other differences, considered by some as sufficient to remove all doubt of its specific value.

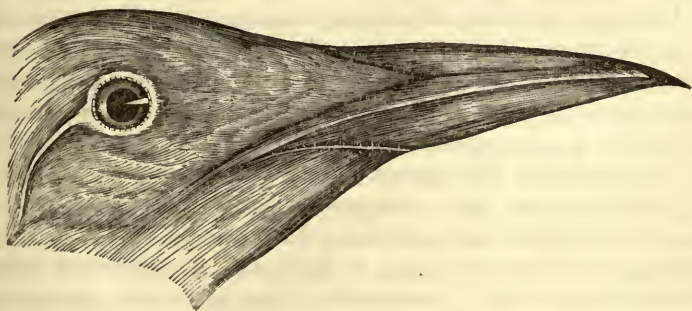
Sir William Jardine, in his "British Birds," remarks that in colour this bird is intermediate in shade between *Uria troile* and *U. Brunnichii*, and that the bill is weaker and more slender, the angle of the under mandible being nearly obsolete. The latter feature he illustrates by outlines of the bills of the three birds, a copy of which diagram I have the pleasure to lay before you. He also remarks that he never found the bird at any of



Uria Brunnichii.



Uria troile.



Uria lachrymans.

the breeding stations on the coast; nor had any of the fishermen, (who are usually very correct in their observations on these matters,) ever seen, or been accustomed to hear of it.

This author's account, which is the least prejudiced and most scientific, is written in excellent taste, and shews a marked appreciation of what might or ought to constitute a specific difference.

The late Professor Macgillivray, who had a comprehensive and most accurate knowledge of marine ornithology, describes his *Uria troile*, in his "Manual of British Ornithology," from a specimen of the bird now under consideration, apparently through sheer contempt of any claim it had to be considered different. "In summer," he says, "it has a white line round the eye," etc., and finishes his description by adding, "some individuals want the white lines on the head." This author knew Guillemots too well to believe that the absence of these lines was the exception to the rule; consequently in his subsequent extended work on "British Birds," he makes an awkward attempt to follow previous writers by introducing the "Bridled" Guillemot as a lately-described species, under the name of *Uria lachrymans*. In addition to a carefully-prepared specific description, he gives a woodcut, shewing the head with its white lines and slender bill, which, when contrasted with the figure of the Common Guillemot preceding it, shews at once he felt anxious to make a species of it. His characters, which he says were noted from examination of specimens, differ from those pointed out by Sir W. Jardine; for while the latter author states, and shews by his diagrams, that the angle of the lower mandible is near the base, and very slightly developed, Mr. Macgillivray asserts it is further from the base than that of the common species, and is *prominent!* As a piece of original description he remarks that the interdigital membranes are *full* in the bridled bird, and emarginate in the other; but from unlimited means of judging, I can hardly say the so-called distinction is of any value. Compare the feet of those before you with the single member cut from a common bird, and you will not find a shade of difference.

Mr. Gould, in his "Birds of Europe," mentions his doubts of the specific value of the marks which distinguish the Ringed Guillemot. These he considers as nothing more than the white lines; yet he figures and describes it as distinct, leaving others to judge. Sir W. Jardine, M. Temminck, and some others consider it as a separate species, as likewise did the late Mr. Yarrell.

The safest position with regard to it is to wait for further evidence before deciding, as any undue eagerness to settle the matter can never advance our information on the subject. Mr. Archibald Hepburn, in a paper read before the Wemerian Society of Edinburgh, and afterwards published in the proceedings of the "Berwickshire Naturalists' Club," gives an elaborately-prepared account of a specimen which was killed at the Bass Rock,

in 1840. This description in every particular could be then applied to the well-known species, with the exception of the lachrymose stripe; and this specimen is referred to as a species by Dr. Fleming, who at one time repudiated its claims to notice as such. This shews the prevailing tendency to recognise it without doubt, or at least to allow it to remain where it is. Some collectors, however, are not proof against that objectionable desire to find out something more than the debatable differences; and we therefore hear of specimens having been procured through some circumstance hardly observable, such as a difference in the mode of flying or swimming, which, in examples of such close relationship as the present, can only be received with extreme caution.

On the other hand it is equally unsafe to allow prejudice to influence any decision, and those who consider the bird a *variety* only, may impatiently condemn its claims to rank as a species.

Mr. Proctor, Sub-curator of the Durham Museum, found, during a visit to Grimsay, north of Iceland, the three Guillemots—Brunnichii, troile, and lachrymans, all breeding in separate colonies, their eggs being distinguishable by the natives, and each of the birds being known by a different name. This apparently conclusive testimony is, however, contradicted by the evidence of Mr. J. Wolley, who at a meeting of the British Association, in 1850, read an account of a two months' visit to the Ferroc Islands, where he found the two birds we are speaking of breeding promiscuously, in the proportion of *one* ringed bird to *ten* without that ornament. He collected the eggs of both, and could not distinguish between them.

Having then noticed the difficulties which prevent any satisfactory decision with respect to the Ringed Guillemot, I shall proceed to notice the evidence both in favour and against its specific identity, which I do without hesitation, having materials in my possession, not enough perhaps to clear up standing doubts, but sufficient in themselves to justify an attempt to correct errors in describing details, in so far as the average value of these details becomes diminished, if not altogether lost. Every writer has attempted to establish some characters whereby we may distinguish the one bird from the other, and no one has done so better than Sir William Jardine, who observes in his Manual that he has no hesitation in considering the Ringed or Bridled Guillemot as "one of those closely allied species which we frequently meet with in particular genera." The specimens from which he formed his conclusions were lent to him by Mr. Gould, and were without a doubt strongly marked and characteristic; hence from his limited means of comparison at the time he wrote his account he was probably led into the erroneous belief that these characters, so apparent in the individuals which he examined, were permanent.

Taking a characteristic specimen of the *Uria lachrymans*, we find that

when compared with a veritable "Marrot," (*Uria troile*), it presents the marked distinctions of a weaker and more slender bill, and a darker shade of plumage, being a fine dark olive, or, as Sir William Jardine observes, "intermediate in shade between *Troile* and *Brunnichii*;" besides the all-important bridle. But on collecting a number of birds together, the advantages of unlimited means of comparison become very obvious. In both the differences of the bill and the colour there is an imperceptible blending, till the characters assume less and less consequence, and finally are not distinguishable. Further, there is an actual interchange, and thus we find in some cases the Common Guillemot has the weaker bill and the darker shade of plumage, from which we may ultimately argue, if we maintain *two* species, that the common birds so marked are the rarer species which have lost their bridles; while that with the coarse bill and mouse-coloured garb is the commoner one, having borrowed it; in other words, that they become varieties of each other.

As regards size—another of the points which one or two writers have laid hold of—the same gradual transition occurs, that is to say, we have larger and smaller birds in either case. The Ringed Guillemot is said to be the largest, but in both measurement and weight I have never found any *general* advantage on either side; sometimes the one bird being heaviest, and as frequently the other. Differences therefore, to be specific, must be to some extent permanent and general, otherwise they cannot be considered as anything beyond ordinary variety. Ornithologists, however, are not much accustomed to regard varieties like the present instance, (if it be regarded as such,) because if the white ring and line on the head of a Guillemot be considered sufficient to recognise it as a species, we have to look for that mark alone to decide, and are saved the pains of endeavouring to discover whether a plain head ever had any lachrymose stripe, or *when* a marked one acquired the distinction.

We now come to consider the facts which lead some authors to believe in the specific characters of *Uria lachrymans*. It is a bird having its geographical range, its head quarters being Spitzbergen, where it is very abundant. Coming southwards it is found breeding at various localities, still in considerable numbers, becoming less numerous as we leave the northern regions, until we find it very sparingly around the British coasts.

It is said to breed in distinct colonies in high latitudes, where the commoner species and *Uria Brunnichii* are also found in great numbers, though at the Faroe Islands this habit was not noticed. Again, the young bird of the first year's plumage has the peculiar white line as strongly marked as in the old bird. This was observed by Professor Macgillivray, and since corroborated by Mr. H. D. Graham, late of Iona, who found several specimens; these he forwarded to Mr. Selby, who recognised them

as "that rare bird the Bridled Guillemot." Both sexes have this line or stripe, as I myself have ascertained in several instances, and an example of which you have in two specimens before you. In addition I may mention that I have found old birds of the common species, *Uria troile*, become lighter in colour than young ones, while the reverse is the case with *lachrymans*, the young of which is the lightest in shade, the old bird being much darker, approaching in some specimens to pure black. The female of *troile* is said by Temminck and others to be smaller than the male; in *lachrymans* the superior size is in the female. These differences may be advanced, you observe, from actual comparison; yet with a greater number of specimens before us we might have occasion to reverse them.

I offer these remarks without any conviction regarding the subject which has given rise to a difference of opinion amongst ornithologists. For my own part I feel quite willing to allow our *lachrymose* Marrot to remain registered as a variety until we have sufficient demonstration to the contrary.

I may add it is found all over the British coasts, specimens having been procured from almost every breeding station where the Common Guillemot abounds. The localities whence I have obtained the examples before you are, Iona, Loch Sunart, and Ailsa Craig. With reference to the last-named place, I beg to acknowledge my obligations to John Graham, Esq., Surgeon, Girvan, in whose company I have visited it, and from whom I have received every assistance in collecting specimens for examination.

I have thus endeavoured to give you as full a history of this bird as our published accounts and my own private investigations will admit of; and lay before you these remarks with a view to draw closer attention to the subject, as I believe in this, as well as in other subjects of divided opinion amongst naturalists, facts, and hence the truth, can only be gained by continued and patient research.

Glasgow, July, 1857.

BIRDS' NESTS.

BY O. S. ROUND, ESQ.

(Continued from page 146.)

THE Snipe genus, in which I include all those having the characteristic length of bill and leg, affect very much the same localities, and use aquatic sedges and a few feathers in building; and although their eggs differ much of course in minute particulars, they are yet all speckled with the shades of black, white, brown, and olive, as a general rule. But when we come to the Heron tribe, we find a great difference in their manners; for whilst the Bitterns inhabit and breed in the marshes, the Herons nest in trees, and the Cranes and Storks in old buildings, all laying, more or less, bluish

eggs unspeckled, and using a great mass of loose grassy materials.

The most curious nest, I suppose, of which we have any knowledge, is that of the Kingfisher, or Haleyon; this is placed in a hole of the river bank, and formed of a kind of gelatine of a very hard substance. It is not known to a certainty how this is formed; the most probable conjecture is that these birds, like Hawks and Owls, eat up the bones of fish which they have swallowed entire. These ejected masses must necessarily be impregnated with saliva, which forming a cement when dry, they thus erect their nests, for we may strictly speak of it as a structure, being thus composed chiefly (supposing the supposition correct) of carbonate of lime, which the bones of fishes contain more of than those of any of these creatures. Whilst the Kingfisher sits the weather is usually lovely, which has given rise to the term "Haleyon days;" and his nest bears nearest analogy to the Euculent Swallows' before mentioned, whose nests are like a half cup cemented to the sides of caverns on the sea-shore, and sold as a delicacy for the table by the Chinese and Japanese.

There are a race of birds of which the Ostrich is the first, and finding an example in our Bustards and Stone Curlew, which make no nest whatever, depositing their eggs upon the bare earth. The Nightjar does the same, and the Peewit cannot strictly be said to make any nest. The eggs of all these being placed in such exposed situations, are of a colour so much resembling the ground on which they lie, that they are frequently trodden on before being discovered. The Ostrich's are, however, buff-colour, but these are usually found on the sands of the desert, and hatched by their heat alone.

There is one nest of our own songsters that I must not omit; it is that of the Reed Wren, (*Motacilla salicaria*;) this is built generally over the water at a small height, and supported by and entwined around three or more reed stems or bulrushes by means of cobwebs, formed of grasses, and rather deep; thus being quite secure from noxious animals or almost any creature from which it could fear molestation. There has been some confusion among naturalists about this bird's nest, some stating as above, and others that it builds in the same manner in low hedges and trees near the water; now indeed they are both right and yet wrong, for this bird builds only on the water amongst reeds, as I have described it; but there is a nest almost exactly similar to it, built in the other situations mentioned, but this is the nest of the Reed Bunting, a bird often confounded with the above species, but quite distinct, having a black head and reddish brown plumage; whilst the colour of the other is cinereous brown, with a milk-white streak over the eye. Mr. Sweet took this view of the subject, and he was a very observant naturalist, and one whose opinion may safely be depended upon.

Pigeons are very simple architects, and either use a few sticks in a low tree, which is the manner of the Ring and Turtle Doves, or build in holes of trees as the Stock Dove, or in rocks as the Biset Pigeon, or Rockeer; all lay two white eggs, and are very prolific. I think there are no other birds that I have to speak of now, but the gallinacæ or fowl kind, and these, or a great portion of them, are ours merely by adoption. Thus the Domestic Fowl comes originally from India, where it is found in the jungles, or thickly-wooded districts, in great abundance, as is the case of the Pigeon. Domestication has here worked strange changes: all the fowl kind lay white eggs except the Pea or Guinea Fowl, whose eggs are of a dark cream-coloured shade. Poultry will lay about fourteen eggs each upon the average; they deposit them upon the ground, as is well known, making no nest. Pheasants do the same, but Partridges and Grouse prefer a thick covert, or some good protection against weather or observation; even these, however, collect very little material, except a small quantity of dry grass. The eggs of the Partridge are stone-colour, those of the Pheasant a shade darker and distinctly mottled; those of the Grouse brown, speckled, the Ptarmigan darkest of all. These lay about the same number as the Domestic Fowl, and sit about the same time, namely, twenty-three days.

It appears from the foregoing observations, cursory and brief as they must be to avoid being dry and tedious, that every bird's individual mode of forming an habitation answers best, having regard to its mode of life and necessities; thus we find all those birds whose chief time is spent on the earth itself, depositing their eggs to bring forth their offspring on its very surface; those which are rather more active, and occasionally perch, use moderate shrubs and bushes; others of more powerful wings, which range to greater distances, employ the tall trees of the forest, and sit securely in their aerial mansions; others which depend upon the waters for their subsistence, plant their habitations on the margins of streams and rivers, some kinds on the sea-shore in cliffs and rocks, or desert islands. Those which subsist upon insect food, either reside, as Creepers, in the very trees themselves which supply their prey, or, as the Swallows, in such situations as to be easily entered on the way without obstacle. It may seem anomalous that the Willow Wrens and other small birds which are continually in trees, should choose the ground to build, but I consider this arises from their weakness, which, did they build in open positions, would render them objects of attack without the means of defence; and no doubt if we look minutely into such cases we shall always find some good reason to support them. The bringing up of a family, providing shelter and subsistence for them, and educating them that they themselves may be able to do likewise, is the chief business of life, and the only instance in which this does not hold good universally is our own; but what does this arise

from? certainly not from Nature, for we find it the case with no animals which are more or less regular in their habits; but I suppose there is no instance more forcible and striking in this particular than that of the feathered tribes, whose domestic and parental duties return in regular succession with every spring; and as the youth of the year brings into existence those vegetable products, which await but the sun's all-enlivening beams to spring into life, and growth, and beauty, so they annually choose their partners, and enter into all the domestic labours which occupy with ourselves the whole duration of our lives. I have therefore considered the relative position which this class of beings occupies in the scale of creation, and develops as much as possible that exquisite arrangement by which every thing is brought to an equality, having regard to the circumstances and situations of every member.

Age upon age sees the method and materials which have been used from time immemorial by each little songster, or more noble tenant of air, unaltered, so that the merest school-boy, unlearned enough in other particulars, will tell you with accuracy what bird's nest it is you may chance to find in the absence of the birds who built it. Instinct works by rules so immutable that the same situations are always chosen, because they are the best; how ridiculous would it be for a large bird to build in a thick bush, when he could come at his nest with difficulty, or a small one on the apex of a vast forest-tree. There have not, doubtless, been wanting instances where these pretty creatures have been betrayed by accidental circumstances to choose a very foolish and unsafe place, but this would not have been the case in the wilderness; these are the rare exceptions to that vast and miraculous rule of action which pervades every atom of this beautiful world, and who can regard it without wonder?

ON THE CLASSIFICATION OF THE ANIMAL KINGDOM, BY THE DISTRIBUTION OF THE NERVES.

BY F. M. BURTON, ESQ.

(Continued from page 127.)

No. IV.

THE next great division of the Animal Kingdom, the Heterogangliata, or Mollusca, contains seven classes—*Cirrhypoda*, *Brachiopoda*, *Tunicata*, *Conchifera*, *Gasteropoda*, *Pteropoda*, and *Cephalopoda*.

The term "Mollusca," employed by Cuvier, has long since been considered not sufficiently distinctive to designate this important division, and it has, therefore, by degrees given place to the more important name "Heterogangliata," indicative of the peculiar character of the nervous system, which

corresponds throughout the entire division. All the classes possess nervous ganglia, but instead of their being arranged serially in pairs, (though this is somewhat the case with the *Cirrhopods*,) they are distributed in various parts of the body. The first in order, the *Cirrhopods*, or Barnacles, though very dissimilar in outward form to the superficial observer of the articulated tribes of the Homogangliate division, yet, on close inspection, will be found to bear a wonderful resemblance to them, both in their internal and external structure. The common goose barnacle, for instance, (*Pentalasmis Vitrea*,) seems from its outward shelly texture to belong to the Mollusks, but remove its covering, and we have an animal intimately allied in all its parts with the *Crustacean* class. The shell of this creature is composed of five distinct parts, united together by a strong membrane, except along the anterior margin, where a fissure is left, through which the articulated members can be protruded at pleasure. At the base of the shell this same membrane is prolonged into a hollow cylindrical foot-stalk, which attaches the animal to any submarine support. This tube, by means of internal muscles placed longitudinally, can be bent any way at the will of the animal. The oral apparatus is situated at the base of the fissure spoken of before, and is provided with a rudimentary apparatus of jaws, furnished with minute palpi, and three pairs of mandibles. Behind the mouth are certain fleshy appendages which constitute the branchial or respiratory organs. Above the mouth are six pairs of articulated limbs or *cirrhi* on each side, which are used by the animal for the prehension of food; while, at the extremity of the body, we find a long flexible tail-like organ, perforated by a minute aperture. The nervous system also, as well as the external shape, assimilates strongly to that of the *Crustacea*, in the Homogangliate division. It consists of a supra-œsophageal mass, or brain, from which issues a chain of double ganglia, arranged along the ventral margin, and from thence nerves are distributed to the *cirrhi* and surrounding parts. The muscular system is well developed, and is appropriated, says Professor Jones, "partly to the movements of the shell, and partly to the general motions of the body." Their food consists of entomostraca and other minute animals, caught as they are swimming past, by the flexible cirrhus arms, which are alternately expanded and drawn in. Their digestive apparatus consists of a mouth, armed with strong lateral jaws, a short œsophagus, provided with two salivary glands; a capacious stomach, surrounded with cœcal appendages, representing the liver; and a simple intestine placed along the dorsal part of the animal, and terminating at the root of the tail-like organ before spoken of, which is placed at the top of the longitudinal fissure. Little seems to be known respecting the circulatory system of these animals, and their respiration is effected by the branchial organs spoken of

before, and the long cirrhus arms, which by their action expose the blood to the surrounding medium. With regard to their means of reproduction the most various opinions are expressed, and no two authors seem to be agreed upon the point. They are no doubt hermaphrodite; and, according to Cuvier, the eggs are collected in a large vascular mass covering the liver, and are ultimately expelled through the perforated tail-like organ before spoken of. Others, in direct opposition to this view, state that the foot-stalk of the animal is the true ovary, while other authors, and they are probably correct, make out both to be right by asserting that after the eggs are produced in the manner stated by Cuvier, they are carried by the tail-like ovipositor into the cellular texture of the pedicle, and there retained for some time, when they are again expelled by some means or other from the pedicle, which, while they remained there was of a bluish colour, and are then found occupying the space on both sides of the animal between the body and the shell. The ova at first are of a blue colour; they then become pink, and finally, when ready to be hatched, turn white.

The second order of *Cirrhopods*, the Balani, are not fixed on pedicles, but are sessile; and though they differ from the pedunculated type, in their general internal structure, they are not very dissimilar. One remarkable fact connected with the class we are now considering must not be omitted, which is, that all *Cirrhopods* undergo a distinct metamorphosis, in this respect therefore resembling the families of the Homogangliate division. The young of the Balani indeed have been taken for little Crustaceans. In this state they are quite free, and skip through the water like the *Monoculi* in our ponds; they also possess seven pairs of limbs, a jointed setiferous tail, and large pedunculated eyes. In a short time, however, they become fixed to some rock, shell, or other substance; their arms become gradually ciliated, and their eyes quite disappear. The young of the pedunculated *Cirrhopods* also resemble *Monoculi*, and undergo similar transformations.

The second family of this division, the *Brachiopoda* or *Palliobranchiata*, are so termed from the long arm-like organs with which they procure their food. These organs are situated on each side of the mouth, and in some species can be protruded to a considerable distance, while in others they are confined within the limits of the bivalve shell. Most of them are attached to submarine bodies by a fleshy pedicle, similar to that of the *Cirrhopods*, as in *Lingula* and *Terebratula*; but in the genus *Orbicula*, instead of being fixed by a pedicle, the animals are attached by the lower valve of the shell. The *Brachiopods* are enclosed within the valves by a delicate membranous lining called a mantle, which is fringed all round with cilia, forming a singular respiratory apparatus, which will be presently

explained. The arms, which are contracted and folded up when at rest, are protruded when required by a forcible injection of a fluid to their extremities; their uses are various, the principal one being the procurement of food by means of cilia causing currents in the water. They assist also in opening the valves of the shell by their forcible protrusion, and, probably, when extended answer in some measure the purpose of oars. The mouth is a simple prominent orifice, without any dental apparatus. The alimentary canal varies in the different genera. In *Lingula*, says Professor Jones, "it is a long and convoluted tube, but without a perceptible stomachal dilatation." In *Terebratula*, however, there is a large oval stomach, into which numerous ducts leading from the liver open by large orifices.

In their respiratory system the *Brachiopods* are very peculiar, for instead of possessing proper branchial organs like other mollusks, the mantle is traversed all over with arborescent blood-vessels, which cause the blood to be aerated by exposure; and this is further carried out by the assistance of the cilia before-mentioned placed round the mantle, which by their vibratile action, are continually pouring fresh currents of water over its surface. The cilia placed on the arms do not in any manner assist in carrying out the circulatory process, for the stem itself contains no blood-vessels, and the cilia are of a horny texture. The course of circulation has not been fully made out, but the *Brachiopods* possess a double cavity or heart for passing the purified blood through the body. The nervous system is also little understood; small ganglia have been detected in various parts of the body, with radiating nervous threads. The muscular system, however, is well developed, and is of a peculiar construction, differing materially from all other bivalve mollusks, while their organs of reproduction are also, like the nervous system, but imperfectly known. The ova, when they exist, are invariably found between the layers of the mantle, as is the case with the *Cirrhopods*, but how placed there, and from what source, has not hitherto been made out.

In the next class, the *Tunicata*, we find animals of a much simpler form and structure than those we have been considering, some of the families of which, says Professor Jones, "seem to constitute a connecting link between the Mollusca and the *Bryozoa*, which latter in many points of their anatomy they much resemble." The animals composing this class are not confined in shells, but are enclosed, as their name indicates, in strong flexible bags of a leathery or gelatinous nature. In the most highly-organized family, the *Ascidians*, this tunie or bag is of a soft texture, and is fixed by one end to any marine substance, while at the other appear two projections, one higher than the other, each having a single orifice at the top. Through the highest, the water used for respiration and the materials for food enter, while from the other are cast out the ova and all excrementitious matter.

The animal itself hangs loose in the interior of this outward covering, and possesses a simple heart, a mouth which is peculiarly situated very low down in the body of the animal, a short œsophagus, a simple stomach surrounded by a liver, and a long intestinal tube. The reproductive system is of the simplest form, and the nervous apparatus but slightly developed.

The most peculiar part of the anatomy of these animals is that connected with their means of respiration. A considerable part of the interior of the body consists of a thin vascular membranous cavity, analogous to the mantle of other Mollusca, and this is covered all over with a perfect net-work of veins, and its interior surface studded with vibratile cilia. Into this cavity the surrounding water is being continually drawn, and, as it courses over the net-work of veins, purifies the blood, which is then conveyed back to the system. This current of water also brings in the materials used for food, which are thus conveyed to the mouth; and in order to prevent the intrusion of any foreign substance which might be deleterious to the functions of the body, a simple remedy is provided, for round the outside of the entrance into the cavity is arranged a row of delicate tentacula, which feel the various atoms brought in by the water, and, if fit for food, they allow them to pass, if not, they reject them as unsuitable. Some of the other families of this group are most extraordinary. Some are not attached like the *Ascidians*, but swim freely about in the water. Some, as the *Salpæ*, have a long thin riband for a branchial organ, over which the blood-vessels ramify, instead of lining the respiratory cavity, as in the *Ascidians*. These animals possess also another most striking peculiarity; they are solitary and aggregate in alternate generations; the solitary individuals produce an offspring which lives gregariously, and they again produce solitary individuals. Numbers of them swim about fastened together like a chain. Other families, as the *Botryllidæ*, are at first free, like the *Salpæ*, and afterwards become fixed. In our own seas we have specimens of all the different genera, and they are very abundant.

The next order, the *Conchifera*, consists of animals which inhabit bivalve shells. Each valve or side of the shell is lined internally with a delicate membrane, called a mantle, bordered with a fringe of retractile filaments, and the uses of this mantle are very various. It is the sole origin of the formation of the shell, and of the spots or streaks of colour with which many species are covered; it also constructs pearls by its nacreous secretion; and in the Scallop tribe it is studded all round with bright specks, which are supposed to be organs of sight. In some species, instead of simply lining the two valves separately, it is united along the edges, so as more or less to enclose the body of the Mollusk, while in many other species it is not confined to the limits of the shell, but protrudes to a considerable distance in the form of a single or double cylinder, fringed at its extremity.

Between the lobes of the mantle are found four delicate leaf-like organs, which are used for the purposes of respiration, and are called the branchiæ; they are covered all over with innumerable vibratile cilia, which, by the currents they cause, serve the double purpose of ærating the blood, and bringing food to the mouth. At the base of the branchial organs is situated the mouth, a simple orifice provided with thin lips, without any dental apparatus. Near the oral aperture is placed a fleshy retractile organ called the foot, which in some species can be protruded to a great length. By means of this instrument many Mollusks can burrow in the sand with great rapidity; others use it as a sucker to keep them in the position which they have chosen to live in; and others employ it as a means of locomotion, by springing with it from place to place; while Byssiferous Mollusks construct with it the cables by which their shells are attached to rocks or other marine substances. The remaining internal parts of the *Conchifera* are the stomach, which varies considerably in different species, the liver, which is usually of a large size, the generative apparatus, which is simple in its structure, the intestine, which is long and convoluted, terminating at the opposite end of the shell to where the mouth is situated, and the heart, which also varies in different species, some possessing an auricle and a ventricle, others two auricles and one ventricle, while others again, as in *Arca*, have four distinct cavities, two auricles and two ventricles. The valves of the shell are connected posteriorly by a ligament or hinge of various formation, which, by its elasticity, serves to keep them apart; and the antagonist to this force is the adductor muscle, which passes interiorly from one valve to the other, and is of great strength. Some species possess only one of these muscles, and are named *Monomyaria*; others (and they are the most numerous) have two, and are termed *Dimyaria*. The nervous system, as would naturally be supposed from the contracted habits of this class, is not very highly developed; a few small ganglia, with nervous filaments radiating from them, have been discovered in various parts; one pair is placed in the proper position of the brain, just above the œsophagus; others are found in the muscles, and near the vicinity of the branchial organs, those of the *Dimyaria* being the most highly developed, in proportion to their increased muscular powers and general structure.

The fifth class, *Gasteropoda*, consists of animals which live either in the sea or on land, and is very numerous. Most of them inhabit univalve shells, a few, as the *Chitons*, have a covering composed of several pieces, generally eight, while many others have no protection at all. "From the superiority of their mode of progression," says Professor Jones, "it is evident that they are adapted to enjoy a less limited intercourse with external objects than even the most highly gifted of the burrowing *Conchifera*," and we therefore find a proportionate increase of development of the nervous

system. In the Common Snail, (*Helix aspersa*), which belongs to the order *Pulmobranchiata*, we have a very good type of the organic structure peculiar to the whole class, though the different genera and species often vary considerably in some one or more particular parts. The body of the animal can be protruded or shortened at pleasure, in consequence of the highly-developed muscular system. When in motion, four tentacula are protruded from the head, the upper pair of which is furnished with a perfect eye at each extremity, and the lower pair more especially form the instruments of touch. The mouth, which is provided with a singular cutting instrument, is placed under the head, and the tongue is covered over with transverse striæ, which, in some species are represented by small recurved hooks. It also possesses an œsophagus furnished with large salivary glands, a stomach, into which four biliary ducts from a large liver pour their secretions, and a simple convoluted intestine, which terminates on the right side of the neck. The respiratory system consists of a good-sized cavity, the roof of which is interlaced with innumerable blood-vessels, and this chamber communicates with the exterior by a wide orifice on the right side of the body, close to the anal aperture. The generative system is most complex and peculiar. Every Snail is hermaphrodite, but not self-impregnating. The ovary is situated in the inmost recesses of the shell, and is provided with a very long oviduct. The Gasteropods are divided into groups, according to the arrangement of their respiratory apparatus. Those that inhabit the sea are provided with branchial appendages of various construction; some of the branchiæ are external, and are placed along the back, and the animals possessing them are termed *Nudibranchiata*; others, as the *Inferobranchiata*, have these appendages placed on each side of the body, under the projecting edge of the mantle; others have the same organs on one side of the body only; others, as the *Pectinibranchiata*, which comprise the inhabitants of spiral univalve sea-shells, have their branchiæ placed in an internal capacious cavity. In these, and other orders not enumerated, the digestive system varies considerably; the mouth alone presents four different types of organization, one like that of the Common Snail already described, another consisting of a muscular proboscis capable of considerable distension and contraction, but without any dental or cutting apparatus, a third like a pair of shears, and a fourth consisting of a singular boring instrument, as in *Buccinum*, with which those little round holes so frequently seen in dead cast-up shells are drilled. Many species are armed internally with a formidable apparatus of teeth; others are provided with sharp cutting instruments in the gizzard to assist their digestion. The respiratory system also varies considerably in the different tribes. The construction of the heart in the great majority of Gasteropods is like that of the Common Snail, and consists of a single auricle and ventricle, but in some of the

lower orders slight variations are met with. In *Chiton*, for instance, we find two auricles and a single ventricle. The organs of reproduction also vary very considerably in the different genera. The lowest orders are, like the *Conchifera*, all hermaphrodite and self-impregnating; the more highly-organized *Pectinibranchiata* are all diœcious; others, again, as the Heteropods, so called from having their foot so compressed as to be only serviceable for swimming purposes, are simply hermaphrodite. Lastly, the nervous system of the animals we are now considering also necessarily varies with the more or less developed organic structure of the different orders. Throughout the whole class it presents the characteristic scattered condition of the Heterogangliate division. The principal centres are the supra-œsophageal mass, or brain, which gives off radiating nerves to the organs of the senses, a large sub-œsophageal mass connected with the former by nervous filaments, and other smaller ganglia in different parts of the body which supply the viscera, and are also connected with the brain and each other by communicating filaments. In the higher orders these ganglia, however, become condensed and concentrated, and, as in the Common Snail, exhibit only two great nervous masses, the supra and sub-œsophageal ganglions, with radiating filaments to the various organs of sensation and the viscera, etc.

The sixth class, the *Pteropoda*, consists of animals which live on the surface of the waves, and swim about by means of two small instruments placed on each side of the neck, resembling wings. They are found sometimes in immense quantities, and form the food of *Cetacea* and other inhabitants of the ocean. The heads of these animals are composed of various complex parts. The mouth is a simple triangular opening, armed with a very singular dental apparatus, and a tongue covered on the upper side with sharp recurved hooks. Round this mouth are placed six small hollow tubercles, each one containing a number of little suckers, which can be protruded at pleasure, and various other tentacular appendages. The digestive apparatus consists of an œsophagus, a wide stomachal cavity surrounded by the liver, and an intestine which turns upwards to the left side of the neck, where the anal aperture is situated. The nature and position of the respiratory apparatus has not been yet satisfactorily made out, but the animals possess a heart with a single auricle and ventricle. "The generative system resembles," says Professor Jones, "in all essential particulars that of the most highly-organized Gasteropods, and, as in them, is composed of a complete set of male organs, as well as of ovigerous viscera." These creatures, besides organs of touch, are possessed of a pair of very complete eyes situated on the back of the neck; and, as we might expect from the perfection of these organs, and the completeness of their general structure, though, so insignificant in size and occupying so small

a portion of the vast surface of the globe, yet the animals belonging to this class possess a nervous system which fully entitles them to be placed in the high position they hold as regards the general Animal Kingdom, and is, in fact, necessarily commensurate with the superior development of their various organs. The nerves are easily discoverable, as they are of a pale red colour; and the ganglia, instead of being found in scattered masses dispersed through the body, according to the usual Heterogangliate type, are concentrated in the form of a ring round the œsophagus. There are eight large and two smaller masses in this part, and from them are given off filamentary nerves to all parts of the body, a type of structure which would seem to bear the same relation to the former classes of this division as that of the Spiders does to the lower orders of the Homogangliate world. The different genera resemble one another in most of the important types of their structure, with only a few modifications. Some species possess thin glassy shelly plates on the dorsal and ventral aspects of their bodies, and others have small spiral shells. In our own immediate seas this class is not numerous, and we possess only a few species.

In the last class of this division, the Cephalopods, we find animals of a very peculiar description, and presenting a much higher state of development than anything we have hitherto met with. They are divided into two great orders, the Dibranchiate and Tetrabranchiate Cephalopods, from the number of their respiratory organs.* The former are the most numerous, comprising all the animals of this class now in existence, except the *Nautilus Pompilius*. The body of the Cephalopods consists of a bag, enclosing the viscera and organs of digestion, and a head furnished with a pair of eyes and a number of singular tentacula armed with powerful suckers, which vary considerably both in shape and size in different species. The eyes are generally large and staring, but their structure in the two divisions differs materially; those of the Tetrabranchiate *Nautilus* are very simple, and are attached to the head by pedicles, while those of the Dibranchiate order are much superior, and conform somewhat in type to the visual organs of vertebrate animals. The mouth in all Cephalopods is placed near the centre of the feet-like tentacula, and is generally surrounded by a thick circular lip, which encloses a pair of horny jaws or mandibles, resembling a parrot's beak turned upwards. Inside this beak is a fleshy lobed tongue, partly covered with sharp recurved hooks, as in *Pteropoda*. The œsophagus is short, leading quickly into a large dilating crop, which is succeeded by a powerful muscular gizzard, passing into a simple slightly convoluted intestine, and which, analogous to that of the *Pteropods*, mounts up to the head, at the base of which the anal aperture is situated. The liver is of a large size, and the bile is poured into a singular chamber appended to the head of the intestine, with which it communicates. Besides the organs

above enumerated, the Cephalopods possess four salivary glands which communicate with the mouth, and, with the exception of *Nautilus Pompilius*, they all possess a remarkable organ situated in the vicinity of the anus, from which they can, when assailed, pour out a secretion of a dark inky colour, and thus, by rendering the surrounding fluid opaque and turbid, escape from their pursuers. The Cephalopods also possess the first rudiments of an internal osseous skeleton, the principal part of which is situated in the head, enclosing the œsophagus and brain, and corresponds with the cranium of a vertebrate animal. Besides the senses of touch and sight indicated above, this class possesses a slight sense of smell, and in the Dibranchiate order we find also a rudimentary type of an ear. The branchial organs consist of a central stem with broad vascular lamellæ, and are situated within the bag enclosing the viscera, and this respiratory apparatus is not only used for ærating the blood, but, by its alternate drawing in and expulsion of the surrounding medium, it forms one of the principal means of locomotion, by jerking the body of the animal through the water backwards. The circulatory system is very complete, and in the Dibranchiate order two distinct hearts are found, one on each side of the body. As regards their generative apparatus, all the Cephalopods are diœcious, and in both sexes these organs present a structure peculiar to the class. The eggs of the Common Cuttle-fish, (*Sepia officinalis*), are of a black colour, and somewhat resemble a bunch of grapes. From what has now been stated, we shall naturally expect to find a nervous system of a far higher development than anything we have yet met with, in accordance with the superior general organization of the class we are considering, and such, of course, is the case. The principal encephalic ganglion, which, as Professor Jones observes, "is now from its size and structure fully entitled to be called a brain," is enclosed in the cartilaginous skull already mentioned, and, as in the *Pteropoda*, forms a ring enclosing the œsophagus; in this respect, therefore, it is inferior to the brain of vertebrate animals, and accords still with the Heterogangliate type of this organ; for, although now united into one mass, yet this is effected only by the gradual concentration and necessary enlargement of the ganglia met with in the lower orders of this class, and presents somewhat the same analogy to them as the concentrated nervous system of the butterfly does to the more numerous ganglia of the caterpillar. From this nervous ring are given off cords, which communicate with the optic ganglions, now considerably developed, especially in the Dibranchiate genera, and also nervous twigs to the remaining organs of sense and other parts. In addition to these, we find also nervous ganglionic masses of considerable size distributed in different parts of the body, which supply the muscles and viscera, and are variously developed, in proportion to the importance of the organs over which they preside.

(To be continued.)

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 163.)

- Canis Vulpes, *Auctorum*. Vulpes cruciger, *Pallas*.
 Canis fulvus, *Desm. F. Cuv. Schinz.*
 C. decussatus, Desm. C. argentatus, Desm. F. Cuv.
 Canis decussatus, *Geoff. Schinz.* *C. cruciger, Schreb.*
 Canis argentatus, *Shaw. Cuv. Geoff. Schinz.*
 Canis melanogaster, *Bonap. Schinz.* *C. Vulpes hypomelas, Wag. Schreb.*
 Canis Vulpes montanus, *Pears. Schinz.*
 Canis himalajanus, *Schinz.* *C. himalaicus, Roiles.*
 Canis niloticus, *Cretsch. Rüpp. Desm. Schinz.*
 Canis chrysurus, *Gray. Schinz.*
 Canis melanotus, *Pall. Schinz.* *C. Karagan, Erxl.*
 Canis famelicus, *Cretsch. Rüpp. Schinz.*
 C. Sabban, Ehren.
 Canis Zerda, *Zimm. Schinz.* *C. Cerdo, Linn. Gmel. Viverra aurita, Blum. Megalotis Cerdo, Illig. Desm. M. Brucei, Griffith.*
 Canis pallidus, *Rüpp. Schinz.*
 Canis bengalensis, *Shaw. Gray. Schinz.*
 C. Vulpes indicus, Hodg. C. Xanthurus, Proc.
 Canis Corsak, *Fisch. Schreb. Pall. Shaw. Wag. Schinz.*
 Canis Velox, *Fisch. Schinz.*
 Canis cinereo argentatus, *Schinz.* *C. cinereo argenteus, Schreb. Cuv. C. virginianus, Gmel.*
 Canis lagopus, *Linn. Schreb. Pall. Schinz.* *C. Isatis, Gmel.*
 Canis magellanicus, *Gray. Water. Schinz.*
 Canis fulvipes, *Mart. Schinz.*
 Canis Azaræ, *Cuv. Schinz.*
- Canis Kokree, *Sykes. Schinz.*
 Canis Hodgsonii, *Schinz.* Vulpes Hodgsonii, *Gray.*
 Canis dorsalis, *Schinz.* Vulpes dorsalis, *Gray.*
 Canis melampus, *Wag. Cuv. Schinz.*
 Canus vetulus, *Lund. Schinz.* *C. Azaræ, Water. Wag.*
 Canis melanotomus, *Schinz.* *C. brasiliensis? Lund.*
 Canis Hodophilax, *Temm. Schinz.*
 OTOCYON.
 Otocyon caffer, *Lich. Schinz.* Canis megalotis, *Cuv. Desm. C. Lalandii, Desm. Megalotis Lalandii, Smith.*
 NYCTEREUTES.
 Nyctereutes viverrinus, *Schinz.* Canis viverrinus, *Teum.*
 Nyctereutes procyonoides, *Schinz.* Canis procyonoides, *Gray.*
 HYÆNA.
 Hyæna striata, *Zimmer. Schinz.* *H. vulgaris, Desm. Canis Hyæna, Linn. Schreb. Pall.*
 Hyæna brunnea, *Thun. Schinz.* *H. fusca, Geoff. Cuv. H. villosa, Smith. Linn.*
 Hyæna crocuta, *Zimm. Schinz.* *H. maculata, Thunb. H. capensis, Less. Canis crocuta, Erxl. Schreb.*
 PROTELES.
 Proteles Lalandii, *Geoff. Schinz.* *P. cristata, Steed. Viverra hyenoides, Desm.*
 FELIS.
 Felis Leo, *Linn. Schreb. Cuv. Fr. Cuv. Griff. Schinz.*
 Felis concolor, *Linn. Schreb. Fr. Cuv. Desm. Temm. Schinz.* *F. discolor, Schreb. F. Puma, Shaw.*
 Felis Tigris, *Schreb. Cuv. Tem. Schinz.*

Felis Onca, Linn. Cuv. Temm. Fisch.	Felis macrocelis, Temm. Cuv. Schinz.
Felis Leopardus, Temm. Cuv. Fr. Cuv.	F. nebulosa, Griff.
Schinz. F. Pardus, Linn. Cuv. F.	Felis Maracaya, Wag. Schinz.
chalybeata, Schreb. F. antiquorum,	Felis pardalis, Schinz. F. Ocelot, Tem.
Smith. Griff.	Felis brasiliensis, Cuv. Wag. Schinz.
Felis Pardus, Temm. Schinz. F. vari-	Felis tigrina, Schreb. Fr. Cuv. Geoff.
egata, Wag. Schreb. F. melas, Fr.	Temm. Griff. Fisch. Wag. Schinz.
Cuv. Schreb.	Felis macroura, Schinz. F. oceloides,
Felis uncia, Schreb. Schinz. F. Irbis,	Temm. F. Wiedii, Schinz.
Ehrenb.	Felis elegans, Less. Schinz.

(To be continued.)

Miscellaneous Notices.

The Corn-crake, or Land-rail.—White states this bird to be rare in his district, seldom seeing more than one or two in a season, and these only in autumn. It has always been a regular visitor round this neighbourhood during the summer months, but I do not remember it as early as this year. Yesterday, May 10th., in the forenoon, it was distinctly heard in a grass field to the north of my house, and in the afternoon I again listened to it in another field eastward. *White* doubts its being a bird of passage, from its formation being so poorly qualified for migration. *Markwick* entertains a different opinion, and says he has seen it fly very swiftly, and the editor of a late edition of "*White's Natural History of Selborne*," calls it a bird of passage and a summer visitor to this country; its appearance therefore so early in the spring, and in such cold weather, seems to me deserving of notice.—*THOMAS FULLER*, Weston Road, Bath, May, 11th., 1857.

Singing Birds near Large Towns.—That the smoke of our great town of Leeds drives away our song birds is but too true. Seven or eight years ago the Redstart, Common Linnet, and Golden-crested Wren were not uncommon here, (about three-quarters of a mile from the outskirts of the town,) but now they have nearly all disappeared. On the 29th. April this year, however, I was rather surprised at seeing a Goldfinch in a field not more than a quarter of a mile from the eastern border of the town.—*E. J. M.*

"*April Showers bring Spring Flowers!*"—Where were those showers this year? What a month was last April! the wind north or north-east nearly the whole thirty days. Snow, hail, and frost—sugar and rum at a discount—not a moth or butterfly,—yes, one or two. On the 1st., *Stabilis*; on the 8th., *Rhamni*; 16th., *Gothica*; 20th., *Instabilis*; May 2nd., first white Butterfly; *P. brassicæ* on the 10th.; and on the 16th., *H. abruptaria*. The first Swallow on the 15th. of April; Cuckoo on the 9th. of May; Swifts

on the 12th.; saw a large flight of Fieldfares on the 2nd. The Dotterel arrived last week on the lands adjoining the coast, where it generally remains a week or so during its spring and autumnal migrations.—R. P. ALINGTON, Swinhope Rectory, May 18th., 1857.

Sphinx Euphorbie at *Box Hill*.—On the 5th., in close proximity to a favourite locality for *T. pastinum*, (the 'Black Neck,') I espied the above rarity at rest on a fence, which I was not long in boxing. This is, I believe, the first specimen ever taken in that neighbourhood. Within another half-hour I had taken six of the *Pastinum*, when a continuation of smart showers stopped collecting. *P. albus*, (Little Blue,) was abundant; also *Galathea*, (Marbled White.) Visited the same ground on the 6th., but without success. Tried the sugar-pot to a late hour for *Leucophaea*, but he would not come out; so that after boxing half a gross of small fry, returned to the 'land of smoke.'—JAMES GARDNER, Naturalist, 52, High Holborn, London.

Reviews.

The Natural History Review. July, 1856, Part XI. Price 2s. 6d. London: WILLIAMS AND NORGATE. Dublin: HODGES AND SMITH. Edinburgh: WILLIAMS AND NORGATE.

THE following are the contents of this Part, which contains three Plates:—
 Review 1.—"Popular History of Palms and their Allies." By B. Seeman.
 2.—"On the Variation of Species." By J. Vernon Wollaston. 3.—"Natural History of the Animal Kingdom." By W. S. Dallas. 4.—"June; a Book for the Country in Summer Time." By H. T. Stainton. 5.—"Shells and their Inhabitants." By H. & A. Adams. 6.—"Introduction to Entomology." By W. Kirby and W. Spence. Seventh Edition. 7.—"A Re-arrangement of the Nomenclature of British Coleoptera. Part I.—Geodephaga-Philhydrida." By J. F. Dawson and Hamlet Clark. 8.—"The World of Insects; a Guide to its Wonders." By J. W. Douglas. 9.—"Practical Hints respecting Moths and Butterflies." By R. Shield. 10.—"Manual of Entomology. Vols. III—V." By Hermann Burmeister. 11.—"The Natural History of Ireland. Vol. IV." By the late William Thompson.

ORIGINAL COMMUNICATIONS MADE TO VARIOUS SOCIETIES.

Proceedings of the Dublin Natural History Society.

I.—"Remarks on the Fungi of the South-west of Ireland." By William Andrews, Esq.

II.—"On the Genus *Skua*." By Charles Farrar, Esq., M.D.

III.—"On the Occurrence of Rare Birds in Ireland." By Lord Clermont,

IV.—"On *Asplenium Trichomanes*." By W. Andrews, Esq.

V.—“On the Occurrence of the Egyptian Goose, (*Chenalopex Egyptianus*), in Ireland.” By R. J. Montgomery, Esq.

VI.—“Remarks on some Birds that occasionally visit Ireland.” By J. R. Kinahan, Esq., M.B.

VII.—“On the Natural Affinities of Botrychium and Ophioglossum.” By J. R. Kinahan, Esq., M.B.

VIII.—“*Saprolegnia Ferox* attacking Gold Fish in Vivaria.” By Dr. Fraser.

IX.—“Change of Colour in a Fowl.” By R. P. Williams, Esq.

Journal of the Dublin Geological Society:—

X.—“Report of the Council for the year 1855.”

XI.—Donations received to the Library since February, 1855.

XII.—“On the Geology of the Lake District of Killarney.” By G. V. Du Noyer, Esq., (Illustrated with woodcuts.)

XIII.—“Researches among the Palæozoic Rocks of Ireland, with a View to determine the limits of the Old Red Sandstone, and its relation to the Inferior Rocks.” By John Kelly, Esq.

XIV.—“Tabular List of Localities in Ireland, where Junctions occur of Old Red Sandstone, with the Rocks which lie beneath it.” By J. Kelly, Esq.

XV.—“On the Lower Carboniferous Beds of the Peninsula of Hook, County of Wexford.” By the Rev. Samuel Haughton, M.A., Professor of Geology in the University of Dublin.

NOTICES OF SERIALS.

America.—“Smithsonian Contributions to Knowledge. Vol. VII.” “American Journal of Science and Arts. Vol. XXI.” “Canadian Journal. New Series. Parts I. and II.”

Russia.—“Bulletin of the Moscow Society of Naturalists. Vol. XXVIII.” “Archives of Natural Science for Livonia, etc. Series I., Vol. I., Part I.; and Series II., Vol. II., Part I.”

Germany.—“Transactions of the Imperial Academy of Naturalists. Supplement to Vol. XXIV.; and Vol. XXV., Part I.” “Transactions of the Berlin Academy, for A.D. 1854.” “Journal of Scientific Zoology. Vol. VII.” “Archives of Anatomy and Physiology, for 1854 and 1855.” “Transactions of the Imperial Geological Institute. Vols. V. and VI.” “Journal of the German Geological Society. Vol. VI., Part IV., and VII., Part I.”

Switzerland.—“New Memoirs of Swiss Society of Natural Science. Vol. XIV.” “Bulletin of Vaudois' Society of Natural Science. Vol. IV., No. 32-35.” “Memoirs of Genevese Society of Natural History, etc. Vol. XXIV, Part I.”

Holland.—“Journal of Natural Science of Dutch India. Part III., Nos. 3-6.”

France.—"Archives of the Museum of Natural History. Vol. VIII., Part III." "Bulletin of the Geological Society of France. Part XII."

Britain.—"Edinburgh New Philosophical Journal. No. VI." "Annals and Magazine of Natural History. No. C-CII." "Quarterly Journal of Microscopical Science. No. XV." "Zoologist, Nos. CLXII., CLXIII., CLXIV." "Transactions of the Entomological Society of London. New Series. Vol. III." "Note on Mr. Newman's Memorandum on the Wing-rays of Insects." "Hooker's Journal of Botany, etc. Nos. LXXXVII-LXXXIX." "Phytologist. New Series. Nos. XII-XIV."

Index Filicum; a synopsis with characters of the Genera, and an enumeration of the species of Ferns, with synonyms, references, etc. By THOS. MOORE, F.L.S., F.H.S., Author of the "Handbook of British Ferns," "The Ferns of Great Britain and Ireland, Nature-printed, etc.," and Curator of the Chelsea Botanic Gardens. Part I., Price 1s. London: W. PAMPLIN, 45, Frith Street, Soho Square. 1857.

THIS work promises to supply, and well to supply, the acknowledged want of a complete catalogue, or as complete as may be, of those elegant plants whose study is at present so popular and fashionable, arranged according to the modern classification.

The British Botanist's Field Book; a synopsis of the British Flowering Plants. By A. P. CHILDS, F.R.C.S. London: LONGMAN, BROWN, GREEN, LONGMANS, AND ROBERTS. 1857.

THIS work is in a portable form, intended for the pocket of the botanist abroad. It contains a short description of every British flowering Plant, and is altogether well executed and neatly got up. The descriptions are necessarily very brief, but for them to be otherwise could not consist with the portableness of the book; as a pocket companion—a "vade mecum." The work begins with a copious glossary of the terms used.

The Querist.

Mistletoe.—Your contributor, Mr. J. McIntosh, asks for information from those who have seen this plant on the oak. The request induces me to send the following 'note,' and append to it a 'query':—"I never saw more plenty of righte oke miscel, then Hugh Morgan shewed me in London. It was sent to hym oute of Essex; wher as there is more plenty then in anye other place of Englande that I have been in."—*Turner's Herbal*, 1562. Is Mistletoe still abundant on the oak in Essex?—R. WILBRAHAM FALCONER, Bath.



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O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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CHARACTERISTICS OF COMMON BIRDS.

BY O. S. ROUND, ESQ.

No I.



IN my former papers on this subject, I have chiefly considered those of the feathered race which are as familiar to us as household objects; for the Sparrow that sits on the house-top, or the Redbreast that hops about our path, are surely no less usual to our eye than pussy as she purs on the hearth, or Toby as he snores on the mat. There are, however, as I have also remarked, common birds which we must go abroad to see, and which are equally well known to those who saunter in the cool shade, or traverse the open field or down. But let us descend into the valley, and here we meet with yet another class; for there is no valley of any extent which has not its stream, and here, beside and over the cool waters, music and nesting, so inseparable in spring and summer-time, are carried on by that intermediate class of songsters, for songsters they almost always are, which have their homes by the river or its tributaries. First and foremost of these is the Reed Wren, (*Motacilla salicaria*,) the *Salicaria* of our friend Gilbert White; and it is no slight proof that it could not have been common, in the ordinary sense, in the moist hollows of that sweet locality, abounding in streams as it does, from the interesting discussions which its identity gave rise to in his scientific correspondence. I think, however, that this may be easily accounted for by the fact that it is not numerous on the banks of mere streams, whilst the true and *bonâ fide* river and its branches can shew you as many as you choose to watch or listen to in an hour's ramble. I have, indeed, met with them far away from Father Thames, and in the near vicinity of the great metropolis, even at its very threshold, but these were wandered pairs, and there was nothing like the merry twittering and chirping which every eyot and osier-bed can furnish on the parent water.

I remember almost the first time I had heard this bird to perfection it made a great impression on me, and I can never recall the memory without deriving from it a certain soothing influence. It was many years since, when suburban railways first enabled gasping, pent-up Londoners to breathe July temperature through a purer medium than London streets; a holiday enabled me to spend the day a few miles from town; it was extremely hot, and, taking an early train, I spent the sultry hours under the shade of green woods as much as might be, but still hot, very hot it was, and when the sun sunk to rest in unclouded glory, the clear sky and cool stillness were exceedingly refreshing, and I can call to mind, as though it were yesterday, sitting on a seat near the A—— station awaiting the

last up-train, and thoroughly enjoying the still cool of the star-lit hour. I had not been long thus when a slight rustling in some dwarf withies behind me attracted my attention, for there was a tiny rivulet that wound its way through an adjoining coppice; and then commenced the sweetest song that, I suppose, ever broke through the silence of the night; the half twitter, the running notes, the inward chirp, and withal the constant variety, which was kept up almost without intermission within a yard of me, never was heard to greater advantage or to greater perfection, and one circumstance particularly favoured me—my near proximity to the little songster; invisible as he was, I could fancy how prettily he was warbling at my side, with his throat swelling and wings quivering; neither did his song lose one jot of its sweetness by its immediate vicinity, nay, so far from it, I am convinced I could appreciate many a tender intonation which but a slight distance might render inaudible. I quite recognised the hurrying manner which White notices; and when, after the whirl of the train, and the dazzle of the gas-lights, and the din of the streets, I once more threw myself on my bed, I speedily dreamed of the dark grove and my little *Salicaria*.

In reference to this bird, it is singular to observe how alike the ordinary notes of all birds of this kind are, I mean a certain harsh twitter or chirp; thus the Marsh Tit, the Reed Bunting, even the Kingfishers, all have much of this, and, if my memory serves me, the Water Pyot too, though his inward warblings are charming. Another thought has often crossed my mind—when do Reed Wrens sleep? for day and night during warm weather do they seem never to cease their warblings. On the Thames they swarm, and every willow bush has its sibilous tenant, and, if you follow the sound, you may soon trace him out with his tawny back and dark eye, with its cream-coloured eyebrow. I do not think we can call him very pretty, and yet he is so, though

“In sober russet clad;”

but at any moment we may see him brought into severe contrast with that beautiful gem of the waters the brilliant Haleyon. Seen in the sunshine in June, sure nothing was ever so lovely; it is emerald and ruby on the wing, but, like many another thing so charming at freedom and distance, once reduced into possession, you wonder at the change. That there is some actual fading from the absence of life, some departure of gloss and brilliance with the departure of motion, I have little doubt, but we do not always reflect how much effect is produced and heightened by contrast and situation, and the Kingfisher accordingly looks nowhere so bright as on his own bright waters, as the song of the Nightingale sounds nowhere so sweet as in the deep darkness of the sylvan night. I know an instance of a patient ground fisherman, who sat so long and so im-

moveable that a Kingfisher settled on his rod; this thoroughly awoke him to speechless admiration, and he never could be afterwards persuaded that his bird and those he saw perpetually under glass could be of the same genus.

Ordinarily speaking, there is some confusion about the Reed Sparrow, Reed Wren, etc., and even our friend Gilbert White made the subject his particular study, coming at last to the conclusion, no doubt the correct one, that the *Salicaria*, that is, the *Motacilla salicaria* of Linnæus, the *Passer arundinaceus minor* of Ray, and the *Sylvia phragmitis* of Bechstein were one and the same bird. The single note is certainly very like that of the Common Sparrow, then of the Whitethroat, and there are some turns which resemble in a small degree the song of the Whinchat; but although the song is very varied, yet, as a whole, there is no confounding him with any other bird; his song is, as White aptly calls it, "a sweet polyglot."

The Reed Bunting is another pretty stream bird, but he is a larger and more sedate and silent bird than our little active, nay restless Sedge Warbler, and I do not call to mind that he has much song; what there is, is, I think, very inward; but he is best known in winter, when, I think, he performs a partial migration to the south, for there are many localities in Berkshire, Hampshire, etc., where he is not known at any other time. The fact, I believe, is, that breeding exclusively on the margins of small rivers, and such places not being so much open to observation as woods and fields, he may be much more common than is usually supposed, but distributed through the country thus, in such a manner as not to be made the subject of common observation. This bird, however, is so clearly an *Emberiza* or Bunting, and the Reed Sparrow* so clearly a *Sylvia*, that it is impossible to confound them, and yet the ignorant, and even those who should have known better, have done so. One thing may have contributed to the confusion, and that is the nest, for this pretty structure in both is placed in much the same situations, and to a certain extent often alike, namely, placed above the water, and attached to the stems of two or more reeds or other stalks of tall water-plants; and a picture it is, with its small eggs, and owners hard by, perching amongst the waving stems, which seem so necessary to their presence. Escape from the whirl of London life to such a scene on a summer evening, and then tell me whether I overrate it, in calling it charming.

(To be continued.)

* Reed Warbler I suppose is meant.—F. O. MORRIS.

A MEMORY FROM STRATFORD-ON-AVON.

BY G. R. TWINN, ESQ.

IN the early part of April, I made a pilgrimage to Stratford-on-Avon, to view the places and objects, that cannot but be interesting to every Englishman, for whom genius and thought are able to present enduring and invaluable charms. The day was one of the warmest and loveliest of the present spring, and our drive along country roads for twenty-four miles, was most enjoyable; for young lambs and goslings, high banks of primroses and anemones, "willow buds swathed in down," and bright expanding leaves on many a tree; the lark's rich melody, and the black-bird's song on fir-tree bough, made such thrills of joy and grateful thought arise in our breast, that we were indeed "overcome."

The Shakspeare Hotel was our resting-place, and having arranged for our bodily wants, we ventured on a tour of the town, and it is to record what (that pertains to Natural History) fell in my way, I pen this notice.

Walking through Henley Street to the house of the immortal poet's birth, we saw revelling in the sunlight at different periods, one specimen of the Brimstone Butterfly, (*Papilio rhamni*;) five of the Small Tortoiseshell, (*Vanessa urticæ*;) and one of the Large White Cabbage, (*Pieris brassicæ*.) In the house itself I was gratified at the nice feeling displayed in so many glasses of primroses and violets neatly arranged; pyramids of daffodils, and a green spray of hawthorn studded with daisy stars, wreathing a bust of the poet.

In the churchyard of the Trinity I sat and watched the lovely Avon sparkling in the gorgeous sun; and over it I saw skimming my first Swallows of the season, in a very noon-day rapture. The Blue Tit and Redbreast I saw busy at their nests, and the Rookery around the sacred building was pregnant with cawing and working. Inside, we saw all that was dear and venerated; read the poet's well-known epitaph, and promenaded that delightful avenue of yew and other trees, that leads to the north entrance. We afterwards rambled along the Avon, and saw the leaping fish beneath the pendant willows on its banks; admired the Golden Crow-foot's gorgeous glare, and thought of Desdemona's song, "Sing all a green willow must be my garland."

At a later period we visited Miss Reason's collection of Shaksperian curiosities, examined the many singular autographs of visitors; and in a private room two nice cases of British Butterflies and a few Bats.

The Mulberry Tree "that Shakspeare loved" was not forgotten by us; (it is in the centre of a fine bowling-green,) and we certainly had a day

entirely devoted to the great man, whose many gems were constantly rising in our mind, and shedding such light, as made us acknowledge a score of times, how multifarious was his mind—how pure his thought—how vast his knowledge—and how rich his power of utterance.

We journeyed home, but our lovely day closed with a violent rain, for nine miles, (leaving Henley-in-Arden,) we had a heavy thunderstorm; but a most magnificent rainbow gladdened the scene, and taught us the old welcome lesson of Hope. Shakspeare has truthfully expressed the character of a man not affected by sweet sounds; and I think we may justly conclude from his writings, that his own soul was equally gladdened by the poetry of earth, and its many illuminated illustrations.

He must have been one of those happy people, whose hearts, attuned to the utterance of Nature, find a superior charm therein, to that engendered by the world. His poor Ophelia made “garlands of Crow flowers, nettles, daisies, and long purples.” She also gives “fennel and columbines: there’s rue for you, and some for me; we may call it herb o’ grace on Sundays: you may bear your rue with a difference. There’s a daisy, I would give you some violets, but they withered all when my father died.” In his sonnets are many expressions testifying to the geniality of his heart, and its appreciation of the dear things of nature: as “the sweet smell of different flowers,”—“lilies white,”—the “deep vermilion of the rose,”—and the great Truth enunciated, “sweets with sweets war not, joy delights in joy.” His eyes had glistened at the rapid flight of the “painted butterflies,” and marked the “russet-pated choughs rising and cawing at the gun’s report.”

The “scratching owl” had doubtless aroused in his bosom wondrous thoughts of the many marvels and superstitions so prevalent; and the following little gem from the “*Midsummer Night’s Dream*” is confirmatory of the belief, that Shakspeare was not altogether regardless of the thousand sources of intense interest and gratification found in Nature’s wide domains.

“The ouzel cock, so black of hue,
With orange tawny bill;
The throstle, with his note so true,
The wren with little quill;
The finch, the sparrow, and the lark,
The plain-song cuckoo grey,
Whose note full many a man doth mark,
And dares not answer nay.”

Pleasant are my memories of Shakspeare and Stratford!

The Elms, Moseley Road, Birmingham, May 2nd., 1857.

ON THE COTTESWOLDS.

BY W. V. GUISE, ESQ., F. L. S.

"Jamque ascendebant collem qui plurimus urbi
Imminet, adversasque adspectat desuper arces."

THAT portion of the ancient Roman road—the Irmin Street—which connects the towns of Gloucester and Cirencester, surmounts the steep escarpment of the Cotteswolds, at the point known as Birdlip Hill; on the crest of which is placed the little village of Birdlip, whose hostelry, the Black Horse, placed on the very verge of the summit, forms a favourite resort of pleasure-parties during the summer months, in consequence of the extraordinary beauty of its situation.

Well, to the Black Horse, upon a beautiful day in the latter end of the last month, (April,) I drove, accompanied by a friend, an ardent and accomplished naturalist, bent upon a long day's *naturalizing* upon the Cotteswolds. We had more than one object in view in selecting the Black Horse at Birdlip upon this occasion, but more particularly because we were desirous, if possible, of satisfying ourselves concerning the existence, at that point, of a rare land shell, the *Clausilia Rolphii*, which a writer in "The Naturalist," in August, 1854, had described as existing there "in several colonies."

The season, early spring, was deemed peculiarly favourable, as it appeared probable that the animal would not yet have wandered from its hybernacula at the roots of grasses and other plants. I must add that we had at a former visit hunted indefatigably for this same mollusk without success; and a friend of mine, an official of the British Museum, well known for his learned work upon the mollusca, though directed to the spot, I believe, by the discoverer, had, equally with ourselves, failed in detecting the desiderated rarity.

Our directions, derived from the gentleman just referred to, were very precise, and we followed them to the letter. The precipitous face of the hill below the Black Horse, and for a long distance westwards, is covered with beech-woods, through which runs a road following the crest of the hill at right-angles to the Roman road. The garden-wall of the little inn bounds this road for a short distance, and where it ceases, a sort of gully worn by the rains leads down through the wood to the angle of a hedge which forms the boundary of the meadow below. This is the hedge which is said to afford shelter to *Clausilia Rolphii*.

At the period of our visit the ground on the side of the wood was richly carpeted with large patches of the Golden Saxifrage, (*Chrysosplenium*,) which, with the frequent tufts of the pretty but inconspicuous Moschatel, (*Adoxa moschatellina*,) gave botanical interest to the otherwise barren hedge-

bank. Here we spent two hours in careful and assiduous search. Not a tuft of grass did we leave undisturbed, and, though it went to my heart to do it, I pulled up by the roots whole plots of the lovely Saxifrage; moss was peeled off and thoroughly investigated, and not a stone was left unturned, yet all in vain. We obtained plenty of other land mollusks, from *Helix pomatia* to *Carychium minimum*, but no trace of *Clausilia Rolfii*. Once indeed my companion thought that he had discovered the object of our search, and the shout of "*Rolfii* at last!" filled me with exultation; but it would not do, the microscope revealed only a stunted and somewhat rugose variety of *C. bidens*, which shell abounded in the finest condition on all the neighbouring beech trees.

Now I should hesitate to take upon myself to assert that because I and others have failed in finding *C. Rolfii*, that it does not exist in this locality, yet it is certainly somewhat remarkable that a critical species such as this, should have been found in tolerable abundance by one individual two years and a half ago, while later investigators, and amongst those two at least possessed of no ordinary intimacy with the forms of mollusca, added to great powers of research and discrimination, should have wholly failed in finding even a *single dead specimen*.

Disappointed in the object of our search, but not unrewarded, for we brought away with us many very beautiful mollusks and a few insects, we returned to the Black Horse, and seated in the sunlight in the garden of the inn, we enjoyed our luncheon "*al fresco*." The rich and varied landscape of the wide vale of the Severn, with Gloucester in the midst, lay spread out like a map at our feet, over which the ever-changing lights and shadows played with all the magical witchery of a dissolving view. We had, however, a good deal more work in front of us, so putting our horse into the shafts away we went, keeping the line of the Roman road towards Cirencester, our object being the *Beech Pike*, some three miles distant.

At the summit of Birdlip Hill we left the highest stratum of the Inferior Oolite, which from thence passes downwards through a succession of rubbly freestone and pisolitic beds until they meet the Upper Lias, which, with the Marlstone or Middle Lias forms the lower slopes of the hill, at the base of which the Lower Lias makes its appearance, and extends far and wide over the "Vale of Gloucester." Our road taking a south-easterly course, permitted us by following the dip of the strata, to investigate some of the higher beds, of which the plateau of the Cotteswolds followed in that direction presents a gradually ascending series.

We had not driven above a mile when we observed the brown band of the fuller's earth in a quarry by the road-side, and the stone slates in heaps by the way for roofing purposes, showed that we had got upon the

lower beds of the Great Oolite. Observing some labourers at work in a newly-opened quarry in a field adjoining the road, we turned in, and found them occupied in excavating these stones for roofing-slates. The beds did not appear to be very fossiliferous, nevertheless we obtained a few characteristic Great Oolite fossils: *Astrea acuminata* and *Pecten vagans* and *peregrinus*; and my companion had the good fortune to find a portion of the claw of a crustacean, apparently an *Astacus*.

Arrived at the Beech Pike, we put up our horse at an adjoining hostelry, and buckling on our impedimenta, we started hammer in hand for a neighbouring quarry. Here we found the labourers at work upon a freestone of fair quality, some short distance above the beds we last visited; it was full of comminuted shell, but entire fossils were rare; nevertheless, the chisel brought out one or two fair examples of *Trigonia impressa* and *Moretoni*, and portions of *Lima cardiformis* were observed. This quarry did not detain us long. Retracing our steps we crossed the highroad about a quarter of a mile from the turnpike, and entered a sort of farm-road, which at the termination of something more than a mile, brought us to Side, a perfect example of a quiet Cotteswold village, seated on the side of a hill overlooking one of those pretty secluded pastoral valleys so characteristic of the district. The cottages being all built of stone, and roofed with the same material, have, in common with the manorial-like farm houses, a grey ancestral look about them which cannot fail to attract the eye and attention of the stranger, while the high gables and square labels over the mullioned windows bear evidence to a remote date of erection, which may be looked for in vain in more busy and populous districts. At the bottom of the valley runs the little stream of the Washbrook, hastening, as do all the many rills and streams on the southern side of the watershed, to bear its tribute to the Isis. On a bank beneath a hazel coppice, but little above the level of the brook, we found a section of the strata exposed, which upon examination proved to be the true Oolite Marl, an Inferior Oolite bed, distinguished by its characteristic fossils, *Terebratula fimbria* and *carinata*. Beneath the hazels, upon the roots of which the plant is commonly parasitic, I gathered some fine blossoms of the Toothwort, (*Lathræa squamaria*), for the most part a scarce plant, but not uncommon in the Cotteswold woods.

Following the downward course of the Washbrook, the upland hamlet of Caudle Green lay over the hill to our right hand, the road to which bordering the course of the stream, presented a pretty section of the Oolite Marl. Presently leaving the valley at a point where a little rivulet descending from the hill-side pours its tributary waters into the Washbrook, the road ascends by a steep incline through Winstone Wood. It would appear that this rivulet is in all probability the index to a line of "fault" of some

importance, as strange to say after mounting the hill to as much as one hundred feet, the same beds of Oolite Marl which we had investigated in the valley below were found to recur, accompanied by the same distinctive fossils, *Terebratula fimbria* and *carinata*, and *Rhynchonella lycetti*. As we journeyed up the hill our passage over the fuller's-earth beds was rendered manifest by the dark brown hue of the mould, as well as by the springs of water which welled out copiously at their junction with the Great Oolite, but no characteristic fossils were obtained. To these clays succeed the lower slaty beds of the Great Oolite, which gradually in their passage upwards assume a more compact character brought us again to the level of the freestone beds which we had examined at the Beech Pike.

The afternoon was now beginning to wear apace, and we found it necessary to make the best of our way to rejoin our gig and horse. A cut across a few fields brought us to the village of Winstone, from whence a road led directly to the point we desired to reach. By the way we observed as noteworthy, that the line of the fuller's-earth beds was plainly discernible in the newly-ploughed ground, by the sudden and striking contrast between its deep brown colour and the light brashy hue of the Oolite surface with which it was placed in juxtaposition, frequently in the same field.

In the course of our day's ramble we collected, besides the fossils named and a few others, two pretty Rhynchophorus Beetles, *Sitona hispidula* and *sulcifrons*, *Byrrhus pilula* and *sericeus*, *Bembidium nitidulum*, and *Olivina fossor*, and the following land-shells:—*Vitrina pellucida*, *Zonites alliarius*, *purus*, *crystallinus*, *Helix aspersa*, *pomatia*, *nemoralis*, *virgata*, *ericetorum*, *lapicida*, *rufescens*, *hispida* and variety *concinna*, *fulva*, *pulchella*, *rotundata*, *umbilicata*, *Bulimus lackhamensis*, *obscurus*, *Pupa secale*, *Clausilia bidens*, *nigricans*, *Zua lubrica*, *Carychium minimum*, and *Cyclostoma elegans*.

Elmore Court, May, 1857.

OCURRENCE OF RARE BIRDS AT ACKWORTH.

BY CHARLES EDWARD SMITH, ESQ.

JUNE 5th., 1857.—A fine Turtle Dove, brought me by a gamekeeper. Though common in the southern counties, they are rare in Yorkshire.

Several Grasshopper Warblers have been heard here this spring. Two were procured.

May 13th., 1857. A Tern or Sea Swallow, shot at Hernsworth Dam. These birds seldom come so far inland. Two years ago I saw a Black Tern hovering over the Dam. Last autumn a Goosander or Merganser, (*Mergus merganser*,) was procured there;—a male bird, as shewn by the curious drum-like enlargement of the trachea, not found in that of the female. Also a Scoter.

A Honey Buzzard shot in a neighbouring village last autumn, and a Ring Ouzel this spring.

In the summer of 1855, some Crossbills frequented a row of poplar trees in this village, feeding upon the larva in the tuberos swellings so common on the leaves of this tree. The Waxwing, Hawfinch, Hoopoe, and Red-necked Grebe have been seen or procured near Ackworth during the last few years.

Some years ago, a gamekeeper slightly wounded a Bittern; upon approaching it, it erected the long plumage on its neck, so that it resembled a huge fan, half expanded its wings, and eyeing the man full in the face, turned round at all his movements, still presenting a bold front on all sides. The dog was the first to begin the attack, and soon retired with a wounded eye. It was only by using his coat as a protection that the keeper secured his bird. Taking it to his cottage alive, he released it in the kitchen. Instantly the Bittern resumed the defensive, and with erected plumage, and eye flashing incessantly from bright yellow to dark brown, it drove every one from the room, and then stalked majestically to and fro. I have frequently seen this poor fellow since he was stuffed by Mr. Reid, of Doncaster.

The same keeper once wounded a Heron, and proceeding carelessly to pick it up, the bird seized him ingloriously by the nose, the sharp, serrated mandible lacerating that member severely. A friend of mine was once struck close below his eye by a dying Heron. In its stomach were forty fishes, besides others that were too far digested to admit of computation.

A recent correspondent remarks upon the Red-backed Shrike destroying the young of other birds:—Last summer a gamekeeper took one alive in a trap, containing a brood of young Thrushes, and set with the intention of catching the parent birds. The Shrike had eaten the heads of the young Thrushes. I saw it stuffed, so there can be no mistake about its identity.

A pair of Shrikes built in the garden of a friend in Essex, who tells me he once found a field-mouse impaled on a thorn near the nest, and very carefully skinned, the skin being drawn over its head. I have several times shot these birds in the south.

Ackworth, Yorkshire, June 10th., 1857.

ON UNITY OF SYSTEM.

(Continued from page 150.)

MANKIND, as it appears, then lived together in one region of the earth, and modern researches help to illustrate the event of the deluge by the observations made on a recently-drained inland sea, as large as the Medi-

terranean, to the north of Syria and of Mesopotamia. This sea, its level being raised by an earthquake, flooded the plains then inhabited by mankind, and the ark was at length stationary above the mountains of Ararat, as the highlands of Armenia were called in early times. In a few months more these mountains were uncovered, and when the ground was dry, the ark was opened, and the third epoch commenced.

Earthquakes, as has been ascertained by their effects, were more frequent and violent in the preceding epochs than in the seventh; but as the creatures of some parts of the present world represent those of former times, so there are still regions in which these electric shocks serve to indicate to us the state of the earth before the creation of man. They and their accompaniments were generally the causes of the close of an epoch, or of a great physical revolution of the earth, and, as if to shew the unity of system, an earthquake was the appointed sign to mark the end of the legal dispensation, or of a moral epoch, and in the concluding part of the Bible, earthquakes are figurative of great political revolutions.

A period of evil, like the former one, seemed about to ensue, when a complete change was ordained in the state of mankind. The prophecy in the ninth chapter of Genesis in some degree foretells this event, which occurred long after, and is related in the eleventh chapter.

By their humiliation in the institution of languages, they ceased to be one community, were dispersed over the earth, and formed tribes more or less distinct from each other in speech, habits, customs, inventions, and even to some degree in organization, on which circumstances the extensive science of Ethnology is founded. Their settlement throughout was just in accordance, or alike in system, with the distribution of animals, degree and difference being observable in the structure of the body, and more especially in that of the mind of the natives (as it was in the mind, and more especially in the body of the quadrupeds,) in Australia, North and South America, and the old world; each greater division containing several lesser divisions according to the same system. The geographical distribution of plants and of animals has two divisions; the first relating to the native kinds of each region, the second to those which have spread from their original habitation to other regions, and often to islands by means of continents which have been since submerged. Both these divisions are represented in some degree by the human race; the first by the original inhabitants of each country, the second by the tribes or nations which have successively mingled with or supplanted the aborigines. It has been remarked that a distinct tribe, as well as a distinct fauna and flora, was appointed to each region. The tribes into which mankind were then disposed had characters as distinctly marked in gradations as those of a species in a genus of animals, and each tribe flourished, and then dwindled like

the creatures of former epochs, but did not generally pass away until some part of each was joined to or assimilated with another and succeeding race.

The study of Natural History would have comparatively but little interest if creation was alike in all places, and in all times of the earth, instead of being different in each region and in each epoch, the regions in some degree representing the epochs; and in like manner the science of ethnology owes part of its attractions to the human race, being in its variations the counterpart of the inferior creatures. The general fact of each nation or tribe being, before its passing away in part associated or incorporated with another people, and thus ever continuing, is also a part of the universal system, and is in unison with the morphology of plants, as will be further noticed elsewhere. The first two thousand years of the epoch of man on earth was represented by the earlier periods of creation, when there was a comparative sameness over the globe; while the after-time of man represents the latter period of creation, when the earth was diversified by mountains, and by the ever-varying associations of plants and of animals.

(To be continued.)

SUNDAY IN THE COUNTRY.

BY O. S. ROUND, ESQ.

WHEN we change the "city for the country air," the contrast is very striking, and to him who has been compulsorily mixed up in the turmoil, bustle, and din which attend a life of business in a great city, it is no less agreeable; it is the difference between natural and artificial; and who can be insensible to the delightful sensations produced by the transition? First, you have a consciousness of emancipation from a thralldom which, although it may be lucrative, cannot be considered either healthful or agreeable. Every one, no doubt, has his tastes, and there are enjoyments in every grade of life, in every position in which fate or fortune may place us; but there is a degree of purity which we find in Nature unequalled, of course, in any other state of existence. The idea of wealth is pleasurable because it gives us the means of enjoying ourselves in any mode which money can purchase; and this idea carries us through, and even imparts a species of pleasure to the merest drudgery. This is of a negative character, and merely so by reflection; but this cannot be the case with the contemplation of the works of Nature. We admire the spruce artizan, dressed in his Sunday's suit, and locking his door after his wife and train of little ones, as they all issue forth for their evening's walk; we admire more the crowds of such that throng the sunny sides of the streets; we do so because it speaks of ease and comfort, and a relaxation from labour, and their own

satisfaction communicates itself insensibly to us; but if we are filled with satisfaction at such a sight, how much more so when it is set off and enhanced by the back-ground of a rural landscape. Some there are who can only enjoy the country by contrast to the town, and who by means of the appliances now so easily within the reach of the most moderate means, make distant excursions when the week's end promises them a day of rest.

"Yet are there those who seek in nearer scenes
The sweeter air, and the enchanting peace,
Which dwell at distance from the peopled din;
Souls that can find without the busy world
The higher joys that contemplation gives,
Can feel the speechless rapture that belongs
To Nature's works alone, that heavenly calm
That lifts the mind to the Omniscient cause,
Breathing, through every sentient being, life!

Oh! how the grateful heart of such beats high,
As leisure bears them forth from other cares,
Perchance to some fair stream, whose waters flow
Peacefully through the vales and sweeping woods,
And woo the mind to peace with all the earth,
Making it soon an emblem of themselves.
The atmosphere itself is purer there,
Than e'en o'er woods and fields, and hastens on
In purer current o'er the glassy tide,
Whilst echo makes her oftenest sojourn there,
And not a sound, however small it be,
But wakes her ready answer, fresh and clear."

We will suppose it young summer, when every green sprout and coloured blossom is in its early freshness, and breathes a separate and exhaling perfume; when the air has just imbibed sufficiently the sun's rays, to give forth, as you meet it, a mild balminess that you court as you pass on. Then such an enchanting and peaceful stillness around, save from the hum of that countless multitude of fairy and minute beings who fill the atmosphere, and yet impede not its circulation or our vision. Then, everything bears the impress of such purity; the air is so clear that the smallest sounds reach the ear with a distinctness that seems to purify our own sense of perception; the crowing of a cock at a farm on the further side of a valley, the yelping of a cur, or the twittering of the swallows as they toy about in mid-air basking in the warm sunshine. Save these sounds all is still except the whistling of the ploughman as he walks through his stable, and sees that his horses have their share of provender, and are properly sorted. I think it is chiefly the stillness which prevails that proclaims the country sabbath. There is an absence also of that teeming life which all the fields exhibit on other days, save when the

grey and moss-grown steeple calls its humble throng within its walls, to hear the word of Divine instruction, and to look forward to something beyond the present, but still to regard the blessings they enjoy with a contented and thankful spirit. Everything has some standard of comparison whereby its merits are determined; and by what can we judge of art but by the works of human hands? Place it beside Nature, and the meanest weed that obscures our paths is far more beautiful in its construction than the most magnificent work of man. What is a city but one continued series of man's works? what the life of its inhabitants but one continued artificial display? It is true that life is sustained by labour, and rendered more pleasurable by those aids which the labour of different arts supplies; but there are many which can be followed without the city's sounds, and among the works of the Creator; there is also a constant wholesome lesson or memento contained in the survey of natural objects, and the man, who, admiring their admirable fitness, finds pleasure in their contemplation, can never be without a monitor to remind him of the source from whence they spring.

"Life is a varying chequered scene,
Where lights and shadows fall;
And he who would attain the mesne,
Must see and scan them all.

Yet chiefly in the fields and plains
Your silent task pursue,
And though bright fancy take the reins,
Let reason govern too.

That painted flower and azure sky,
Beautiful though they be,
May not alone absorb your eye,
Nor cause you not to see

Through them, the Author of them all,
Whose lovely works they are,
Who did into existence call
The insect and the star,

Nor as you wander through the grove,
Where untaught voices sing
In liquid tones their lays of love,
The source from whence they spring.

Doubtless the eye, the ear, the sense,
Were all for blessings given,
But meant by God's omnipotence,
As steps from earth to heaven.

For through his works, 'tis Him we see,
If we but see aright;
And ever should our converse be
The guide to help our sight,

Nor less the sense to bid us feel
His goodness, and to know
That as His works so much reveal,
So much to Him we owe."

Look at the little harebell that grows beside the moorland sheep-walk, how delicately and beautifully it is made; look at even the very purple heath itself, and see how pretty it is, and what a bloom it gives to the face of the landscape, mingling with the green fern, and making such a sweet contrast of bright hues on the hill side. Then again, beneath your feet, as it were, stretches away the undulation of the more cultivated districts, like a miniature panorama of fields and gardens. The little furze-chat sits on the topmost fern-tuft, the swallow sweeps over the surface of the sedge, and scuds away with wild cries, as the kestrel wheels his soaring flight athwart the valley. Here and there are black turf-cocks

on the opposite slope, and some Rustic passes along the ridge in his sabbath attire, with frock which looks as white as snow. And now again, the bell peals for evening prayer, and then to separate to repose, a repose how complete, how untouched by the turmoil of the world or the bitter consequences of ambition! Such a view of life may be despised, but it is unoffending, and leads to a felicity more lasting. Is it not then worthy of industry, that we quit the din of population, and retire to peace amid our native hills and the converse of a few congenial souls, who, like ourselves, can find the true enjoyment of a country sabbath.

Pembroke Square, Kensington, January 3rd., 1857.

BUTTERFLIES.

BY GEORGE R. TWINN, ESQ.

I AM not a professed Entomologist, but a great admirer, nevertheless,

“Of that wonder of wonders,—the bright-winged fly!
That flits to and fro in the azure sky,”

and my calendar generally contains notes of such as cross my path. The accompanying brief list comprises those whose appearance I have noted at, or within a mile of Birmingham; and they are all observed, (the Small Tortoise-shell excepted,) by me, for the first time here, during a period of three years.

March 30th.—The Brimstone Butterfly, (*Gonepteryx rhamni*), in the grounds at the Elms. The following day two specimens were seen.

May 7th.—The Bedford Blue, (*Polyommatus alsus*), flying over our lawn.

May 9th.—Three specimens of the Small Tortoise-shell, (*Vanessa urticae*), basking upon a bed of opening sweet-williams.

June 6th.—A solitary Orange Tip, (*Mancipium cardamines*), which lived for several days in the greenhouse.

June 12th.—Near the top of Stoney Lane, I tried to capture a prize; for a pair of Purple Emperors, (*Apatura Iris*), were revelling amid the lofty trees and sunlight. I should much have liked these, but having no regular implements for securing them with me, I was unsuccessful. Westwood (ed. 1854) says, “This perfect insect is found in the middle of July, in various parts of the south of England:—Epping Forest, Great and Little Stour Woods, Wrabness, and Ramsay, Essex; Badly, Dodnath, and Raydon Woods, in Suffolk; Clapham Park Woods, Beds.; Brinsop Copse, Heref.; Emborne Copse, Berks.; in Warminster, Wilts.; New Forest, Christchurch, Hants.; Monks’ Wood, Cambridge; near Hertford, and Coombe and Darenth Woods, have been given as its localities; to which we may add that it is

occasionally, though rarely, seen in Warwickshire, near Doncaster, and in the Isle of Wight." (Rev. W. T. Bree's MSS.)

I am very glad that I can confirm its appearance in Warwickshire, though not its capture; early as the date of my seeing it may seem.

I should be glad of any information from parties, who have noticed or captured it in June.

The Elms, Birmingham, June 18th., 1857.

THE TREE OF THIBET.

BY GEORGE WIGHTWICK, ESQ.

THE reader is most likely acquainted with the travels of Huc and Gabet, the French missionaries. They speak of the wondrous Tree of Thibet, and the more worthily of our regard because they have *seen* it. We may not apply to men so soberly minded and so strictly veracious as themselves, the lines of Cowper, in reference to the assertions of a Long-Bow, who, speaking of some marvel, says, "I saw it with these eyes!"

"Sir, I believe it on that ground alone;
I would *not*, had I seen it with my own."

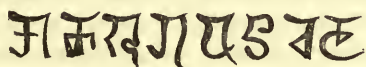
No, Huc and Gabet may be men on whom the superstitious and designing might impose, but they are evidently incapable themselves of anything short of the most honest intentions.

The famed Tree of Thibet then, bearing a name which signifies the "Ten Thousand Images," is existant. Protected by a canopy of silver supported by metal standards, it seems to be some thirty feet high, with a sturdy trunk, from which, beginning about eight feet above the ground, extend horizontally its branches, thickly grown with green leaves, and in season bearing rich and beautiful red flowers. The bark, which is also of a red tint, gives off an odour resembling that of cinnamon, and the description seems to imply that the odour from the tree generally, and when in flower, fills the air with an exquisite perfume.

But the *wonder* lies in one positive, and in another asserted fact; the former relates to the "well-formed Thibetian characters" on the leaves and bark of the tree. On the first they are of a green colour, "sometimes darker and sometimes lighter than that of the leaf itself, and appearing to be portions of the same, equally with its veins and nerves." But I will refer for minute description to "Hazlitt's Translation of Travels in Tartary, Thibet, and China," vol. ii., p.p. 52 to 54. Illustrated London Library, 227, Strand.

The *asserted* wonder relates to the sole existence of this one tree, which is said to defy propagation either by seed or cutting. Tradition assigns to

it an age dating back to the middle of the fourteenth century of our era; but this is scarcely favourable to the speculative imagining of a religio-romantic friend of mine, who asks, "may not this be the *Tree of Life*, rescued from the lost Eden?" It is, however, apparently of great age, the trunk being so large that three men with extended arms can hardly embrace it. Its branches are described as resembling those of the plane tree, and the form of the letters on the bark and leaves may be supposed to resemble the annexed:—



Now it will at once occur to many, that the resemblance, or rather the identity of these letters, when compared with the figures on the leaves and bark of the sacred Tree of Thibet, argues simply for the hypothesis that the characters of the Thibetian language were copied from the forms thus presented by nature, and that the tree, without any extravagant offence to probability, may be regarded as the means which, having survived the deluge, has preserved to us the symbols, and confirmed to us the primal originality of the Thibetian tongue, as that spoken by the world before its linguistic confusion at Babel.

All this, however, is from the strict purpose of "The Naturalist," and my present object is chiefly to start the subject among its readers, in the hope of some intelligent or scientific surmises as to the probable nature of this tree. At the same time, the objects of such a publication may, I conceive, embrace *any* subjects of collateral interest, which may fairly blossom on the branches of such a curiosity as the Tree of Thibet; and many may find additional importance in the study of Natural History when they see it connected with religious or moral mystery.

Of course there is a superstitious legend attached to the Tree of the Ten Thousand Images; and, though you have intimated a wish to keep your contributors down to "plain prose," there may be an occasional cause for exceptive allowance. I have therefore put into verse the legend alluded to, and I send it to you, to be printed or not, as you may think advisable.

Portishead, May 6th., 1857.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 185.)

Felis mitis, <i>Schinz.</i>	F. onca, <i>Schreb.</i>	Hamiltonii, <i>Reich.</i>	F. Griffithii, <i>Reich.</i>
Fr. Cuv. Temm.			
Felis Chibiguazu, <i>Griff. Schinz.</i>	F.	Felis catenata, <i>Hamil. Smith, Griff.</i>	

- Fisch. Wag. Schinz.*
Felis armillata, Fr. Cuv. Schinz.
Felis marmorata, Mart. Schreb. Schinz.
F. Diardi? Jardine.
Felis senegalensis, Less. Schinz.
Felis guttata, Herm. Schreb. Schinz.
F. jubata, Temm. Fr. Cuv. Jardine.
Felis jubata, Schreb. Schinz.
Felis serval, Schreb. Cuv. Temm. F.
capensis, Hill. F. Galeopardus,
Desm. Wag. F. capensis, Forst.
Felis celidogaster, Temm. Fisch. Wag.
Schreb. Schinz. F. chalybeata, Griff.
Felis viverrina, Hodgs. Gray. Schinz.
F. himalayana, Jard. F. viverriceps,
Hodgs.
Felis minuta, Temm. Schinz. F. ser-
valin, Temm. F. javanensis, Horsf.
F. sumatrana, Horsf. F. undata,
Desm.
- Felis servalina, Jard. Schinz. F. or-*
nata, Gray. Wag.
Felis rubiginosa, Schinz.
Felis nepalensis, Horsf. Schinz.
Felis torquata, F. Cuv. Temm. Schinz.
Felis caligata, Tem. Schinz. F. obscura,
Fr. Cuv. Cuv. Fisch. F. caffra,
Desm. F. Chaus, Thun. F. lybicus,
Oliv. F. nigripes, Bur. F. ery-
throtis, Hodg.
Felis Chaus, Gild. Schreb. Tem. Wag.
Fisch. Rupp. Fr. Cuv. Schinz. F.
Catolynx, Pall. F. Rüppelli, Brandt?
Felis maniculata, Rupp. Temm. F.
Ruppellii, Cuv. Schinz. Fisch. Wag.
F. pulchella, Gray.
Felis catus domestica, Schinz.
Felis domestica coerulea, Schinz.
Felis domestica striata, Schinz.
Felis cumana, Schinz.

(To be continued.)

ON THE CLASSIFICATION OF THE ANIMAL KINGDOM, BY THE DISTRIBUTION OF THE NERVES.

BY F. M. BURTON, ESQ.

(Continued from page 183.)

NO. V.—PART I.

WE have now reached the fifth and last great division of the Animal Kingdom, and find organs, which we have hitherto met with only in a rudimentary state, developed to their fullest extent, and various other very important structures, which have not yet appeared at all. Above all, in proportion to the increase of development in the highly-gifted members of the four classes which comprise this division, we shall find the nervous system, the great ruling power of all organic created matter, whether spontaneous, muscular, or sentient, also very considerably increased. One of the greatest distinguishing features of vertebrate animals is the possession of an internal skeleton, composed of very numerous parts.

We have already, in the last class of the Heterogangliate world, met with the rudiments of this internal osseous structure in the cartilaginous cranium which defends the brain, and embraces the œsophagus of the Cephalopods, but we find in the division we are now entering upon, a wonderful internal frame-work, defending and supporting the various fleshy and sentient parts, and

forming a powerful lever on which the entire muscular system can act.

It will not be necessary in a mere summary like this to enumerate all the various parts composing the skeleton in the different classes; suffice it to say that they all, more or less, accord with one great fundamental type, but so endless are the modifications and supplementary processes met with in the different tribes, that no two genera are found exactly alike, and the ideal model of a true perfect skeleton, according to philosophy, does not exist in Nature. There are other organs also met with in the Vertebrate world, which we have not yet seen in even a modified state, such as the spleen, the pancreatic glands, and the Vena Portæ, etc., which will be glanced at as we proceed. The first great class is that of Fishes, animals which, though they possess most of the organs typical of the highest tribe of vertebrate animals, yet in many respects are still found associated with the Cephalopods. In many of them, for instance, the skeleton, instead of presenting the usual osscous structure, is still of a soft cartilaginous nature; moreover in the structure of their scales, whether flat, as in the Perch, or raised and thorny, as in some of the Skate tribe, or in whatever other condition they may be found, they are still in their nature and mode of secretion exactly like the shells, whether internal or external, of molluscous animals. The respiratory organs of fishes are a series of pectiniform branchial fringes supported on bones, and are situated on each side of the neck, and respiration is effected by the continual suction of the surrounding medium through their mouths, which passes by these branchiæ or gills, and so effectually aerates the blood. Their muscular system throughout is very highly developed, and whether as an agent of locomotion or otherwise, is capable of exercising very considerable force. Their mouths are frequently very different in shape and structure; some are quite smooth internally, but, generally speaking, they are more or less armed with teeth and dental plates. To the mouth succeeds a short œsophagus, and generally capacious stomach, as in the Cephalopods, terminating in osscous fishes in a simple intestinal tube; but in those whose skeletons are of a cartilaginous nature, the intestine is capacious and spiral. The liver is always of a large size, and generally contains a quantity of oil, and the biliary ducts open into the intestine. There are no salivary vessels in fishes, but they are provided with pancreatic glands, by which a fluid of a salivatic nature is secreted, and poured into the intestine. In these animals we also find for the first time another set of vessels, called the Vena Portæ, for separating the bile from venous blood, that is, blood flowing from the branchial organs to the heart, instead of arterial blood, as in all previous orders; also kidneys, which are very voluminous, and a vascular organ, called the spleen, for converting arterial into venous blood before its transmission into the liver.

There is also another set of vessels met with in fishes, and peculiar to

the Vertebrate world, which is not found in lower animals, the lymphatic tubes, which absorb the nutritious articles of food, and pour them into the larger veins to be mixed up with the blood. Some fishes are also provided with large swimming bladders, which enable them to float or sink at pleasure. The circulation of their blood, which is of a red colour, is carried on by means of a heart, composed of a single auricle and ventricle, situated beneath the branchial organs, but it is not purely of a systemic character.

The eyes of fishes are much more highly developed than anything we have met with in the lower kingdoms, but do not yet attain the perfection of these organs in terrestrial vertebrata. Their sense of hearing is still very imperfect, and, although superior, is still analogous to that of the Cephalopods. Their organs of smelling are also of a very simple structure, the nostrils not communicating with the mouth, but being merely two blind sacs, and their power of taste must necessarily, on account of the continual exposure to the fluid in which they exist, be of a not very discriminating character. As regards their means of reproduction, these organs in both male and female are still of a simple form, especially in the osseous genera, the cartilaginous fishes being more highly organized in this respect, and being provided with a more complex apparatus. The number of eggs in some fishes is most wonderful, but in others, as the destructive shark and those of the cartilaginous class, providentially they are much less numerous, and are concealed in singular bags of a horny texture, well known to all sea-side rambles under the name of skates' barrows.

Some fishes are viviparous. Lastly, with regard to the nervous system of fishes, we find it very considerably enlarged, according to the vertebrate type, and in proportion to their high organic development. The principal portion, the analogue of the supra-oesophageal ganglion of lower animals, is a large mass situated within the head, called the brain. Though now so concentrated and enlarged, and corresponding in character with that of Terrestrial Vertebrata to a certain extent, yet it still preserves the old ganglionic structure; for, besides that portion called the cerebral hemisphere, the seat of the mental powers in vertebrate animals, and the cerebellum, it is divided into large lobes, which communicate with the different regions of the senses, and other parts of the head and stomach, and from this encephalon proceeds a long chain of nervous cords right down the whole length of the spine, being protected by the superior spinous processes of the vertebræ. From all the principal masses are given off threads, which traverse, and, as it were, animate the whole system, wherever in fact, any power, be it sentient or muscular, is exercised in the highly-organized families of the Vertebrate division; there we find a corresponding adequate system of nerves guiding and directing each process and function of life.

The next great class, that of Reptiles, includes animals of very diver-

sified natures, and presenting a regular gradation from gill-breathing inhabitants of the water to true land animals respiring by means of lungs. The lowest orders of this class indeed are so little removed in organic structure, both internal and external, from the preceding, that it is with difficulty determined to which they belong. Others, again, resemble fishes in the first stage of their existence, and afterwards, when their metamorphoses are complete, possess the principal attributes of the reptile world, while the highest orders, although, like all vertebrate animals, they go through certain distinct changes in their youth, yet, like the two higher classes of this division, Birds and Mammalia, they pass their transformation, or rather series of developments when in the egg state. The class we are now considering is divided into four great orders. The lowest the *Amphibia*, is again divided into *Amphibia Perennibranchiata*, animals which breathe by means of branchiæ all their lives, and *Amphibia Caducibranchiata*, which, although they respire at first by means of gills, like fishes, yet, as they approach perfection, are provided with lungs, of which the frog affords a familiar example. The second order is that of serpents, *Ophidia*, the third lizards, *Sauria*, and the fourth *Chelonia*.

The skeletons of this great class present various structural modifications and additions not met with in those of fishes, which it will not be necessary or possible to enter into here, though to the osteologist, from the exceeding variety of shape and development of the bones met with in the various genera, there is perhaps no class that presents so much interest. "In their muscular development," says Professor Jones, "reptiles are ordinarily slow and languid," though it is remarkable that when dead the muscles retain the power of motion for an astonishing length of time, even when separated from the body. The teeth of the lower orders much resemble those of fishes. Those of the Ophidians are very numerous, particularly in the more venomous tribes. The Saurians possess dental organs that approach in their structure the type met with in the Mammalia, while the Chelonians have toothless horny jaws resembling the beaks of birds. The alimentary canal in reptiles is generally composed of a large œsophagus and a very variably-shaped stomach, which, in one species, the crocodile, closely resembles that of birds, and an intestine, usually divided into two portions, representing the small and large intestines. The secreting glands are the salivary, which are of very singular and various construction, and the liver, pancreas, spleen, and vena portæ, which are developed in the usual way. The absorbent vessels in this class are very elaborate and peculiar in their character, and become very important organs.

With regard to their means of respiration, the different orders, as has been before observed, vary considerably, the lowest breathing by means of permanent gills, others possessing a branchial apparatus, which ultimately

changes to lungs as the animals become terrestrial in their habits; others, again, as the crocodile, which live both under water and on land, possess permanent gills as well as lungs, while others are provided with lungs only. These organs, though they resemble those met with in the higher vertebrata, yet are not so fully developed as in them, and besides this they differ materially in another respect, the tracheæ or tubes, through which the air is brought to the lungs, are in reptiles never divided into branchial ramifications, as in birds and fishes, but terminate abruptly by one or more orifices. The circulatory system is more fully developed than that of the last class, and the heart in the three higher orders consists of three cavities, two large auricles, and a ventricle, but in the lowest order it approximates intimately to that of fishes. In the development of the generative apparatus also we find an approximation to that of fishes in the lowest genera, which gradually approaches in the higher succeeding orders the type met with in birds. The eyes of reptiles present but few peculiarities of structure, but in the higher tribes we meet for the first time with eyelids, some of which present a very complex construction, and also lachrymal glands. The nasal apparatus presents an important difference to that of fishes. The nostrils of the latter are mere blind cavities, but, in the class we are now considering, we find a communication established between the nasal cavities and the larynx, which most materially increases the sense of smell. The ear of the higher reptiles is also more fully developed, and possesses a tympanic cavity and a thin membranous drum, but in the lower genera this organ is still very like that of fishes. With regard to the nervous system, it is as in all other cases, necessarily increased with the gradual organic development of the class, the cerebral hemispheres being proportionately enlarged in comparison with those of fishes, in the rates of increase of power in the various component organs of the body.

Uppingham, June 3rd., 1857.

(To be continued.)

Miscellaneous Notices.

Ornithology in the House of Commons.—It must be a good omen for the progress of ornithology, when no fewer than three references to the subject are made in a single speech in the "House;" such is the fact. In the speech of Mr. Disraeli, on the 27th. ult., on the condition of India, he remarks that a previous speaker had called him the Stormy Petrel of Indian affairs, for that he never made a speech on them except when they were in a disastrous state. He then compares Lord John Russell to the Haleyon brooding on the waters; and again talks of the "Constitutional platitudes"

the said noble lord was in the habit of pulling out of the dusty pigeon-holes of his mind. Had the speech of Mr. Disraeli been made after the 1st. instant, I must have concluded that he had just been reading the article on the Stormy Petrel, published on that day in my "British Birds," but that could not have been the case, however much he and every other member of the two houses may ordinarily study the said work as the best aid they can possibly have in the preparation of their speeches. At all events it satisfactorily shows that ornithological thoughts must be constantly uppermost in their minds.—F. O. MORRIS, Nunburnholme Rectory, August 10th., 1857.

Resuscitation of Plants.—Dr. Cox, in an article to the Royal Society, (Philos. Trans.: No. 108,) after describing the manner he procured salt from *Fern ashes*, states, "That he placed a quantity of it (in solution) in a capacious glass, and after it had been in for five or six weeks, a deposit of the salt was formed at the bottom, from which there sprung out at small distances from each other, about forty *branches*, which, excepting the colour, did most exactly resemble that kind of *Fern* which is single, like Polypody, and not branched, sending out several leaves on each side from one stem." Dr. Cox likewise adds, "that mixing equal parts of Sal Ammoniac and Potashes, and placing the mixture into a tall glass body; immediately upon feeling the heat a great deal of volatile salt was sublimed, and in the glass head he observed to his surprise a Forest in Perspective, of Firs, Pines, etc., so admirably delineated as not to be excelled if imitated by the pencil of the greatest master." Are there any modern instances of such Phoenix-like resurrections corroborative of the above statements on record, or is the inference that the plants mentioned by the worthy Doctor, were productions, not of the salts, but of his own more fertile imagination?—J. P.

Turtle Doves.—The Turtle Doves are particularly numerous here this year; I never before saw so many. They first established themselves here about fifteen years ago, and are very regular in their return—the first week in May.—CHARLES WATKINS, Badby House, near Daventry, Northants.

Eristalis nubilipennis in Ireland.—I took a week's holiday lately, and made a short tour in Ireland, from Dublin to Killarney and the Lakes, and so over the mountains to Kenmare. While crossing the said mountains between the latter-named towns, about a quarter of a mile from a pass called "Windy Gap," I had got off the "car" to relieve the horses, and was rewarded for my humanity by the capture of a fine specimen of *Eristalis nubilipennis*, settled upon a stone wall by the side of the road. I never took but one specimen of this rare fly before, namely, at Charmouth, in Dorsetshire. It is figured in "Curtis," and noticed there as being "in the cabinets of Mr. Dale, Mr. Morris, and the Author."—F. O. MORRIS.

Liparis monacha in Lincolnshire.—I had two *L. monacha* out of chrysalis the day before yesterday. I found the caterpillars ready to change under some dead bark on an oak tree in Legsby Wood.—W. WALDO COOPER, Rectory, West Rasen, July 17th., 1857.

Purple Emperor in Lincolnshire.—A Purple Emperor was taken in the Rectory garden at Linwood last week, by one of the Rev. W. Stockdale's sons. The fly was seen there last year, but escaped.—Idem.

Swallow roosting in a hedge.—I was walking the other evening alongside a large high old-fashioned hedge, when a Swallow scuttled out of the upper part of it. It had evidently been roosting there. It was just in the "duskling" of the evening, sufficiently dark for moths to be flying, and sufficiently light for me to see the Swallow quite distinctly. I do not remember ever to have noticed a like circumstance before.—F. O. MORRIS, Nunburnholme Rectory, July 21st., 1857.

Erebia blandina, etc.—When botanizing on Craig Koynaek, Braemar, one forenoon in the beginning of August last, we had the good fortune to come upon abundance of *E. blandina* upon the rocks and the brakes at their base, but unfortunately had no appliances to lay in a supply this season. In this district *A. Aglaia* is plentiful, and occasionally we find *S. Davus*.—W. SUTHERLAND, M.A.

The Querist.

The Ringed Guillemot.—Referring to the paper on the Ringed Guillemot, by Mr Gray, in the present number of "The Naturalist," Mr. J. Wolley is stated to have asserted at a meeting of the British Association in 1850, as the result of his experience during a two-month's visit to the Ferroe Isles, that the Ringed and Common Guillemites breed there promiscuously, in the proportion of one Ringed bird to ten without that ornament; that he collected the eggs of both, and could not distinguish them. May I be permitted to inquire whether by breeding promiscuously is meant that the Ringed pair with the Common Guillemot, or merely that pairs of Ringed birds breed in the same locality with the Common, in the proportion of one to ten? If the former, would it not settle the question at once, in favour of the Ringed being only a variety? But if the latter, and the Ringed birds are always found to pair together, though breeding in the same locality with the Common or Ringless birds, would it not as certainly determine the Ringed Guillemot to be a separate species?—E. K. B., Kennington, August 4th., 1857.

This is a very sensible question to put, and has come opportunely for a paper I am writing on the subject, to read at the meeting of the British Association at Dublin, on the 26th.—F. O. MORRIS, August 7th., 1857.



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Sideroxylon mermulana. Lowe.

Heberdenia excelsa. Ait.
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the earth is full of Thy riches.—PSALM civ., 24.

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UTILITY OF THE COMMON MOLE, (*TALPA VULGARIS*.)

BY J. MC'INTOSH, ESQ.

(Continued from page 161, Vol. iv.)

THE life of the Mole is passed in such a gloomy region, separated from the light of heaven, and is regarded with such scorn by the illustrious(!) bipeds as cultivators of the soil, that those unacquainted with its habits and manners, look upon them as noxious vermin that ought to be extirpated the kingdom! That such is not the case, we have, we hope, in our previous papers on its utility fully shewn, that they are really the farmers' and gardeners' best friends. We need not say that the Mole is a miner, existing almost exclusively in darkness, and working its way through crumbling earth; large eyes and powerful vision would not only have been unnecessary, but absolutely annoying. The eyes of the Mole are, therefore, the least developed of any of its organs. They are very small, about the size of a pin's head, perfectly formed, and black, and so carefully protected by the surrounding fur as to have given rise to an idea which is still by many entertained, that this useful and wonderful animal is blind. That this idea, which is a very ancient as well as a modern one, is erroneous, may be clearly proved by an examination of the animal itself. The eye of the Mole, by a beautiful arrangement of muscles, can be protruded or withdrawn at the will of the animal, and thus it can accommodate itself either in its ordinary subterranean excursions, or to its nightly rambles above ground, in changing its quarters, and in search of food, as slugs, etc.

The sense of hearing is exquisite, and to it the animal trusts for warning on the approach of danger. Shakspeare, though in error as to the blindness of the Mole, seems to have been aware of its acuteness of hearing, when he says:—

“Pray you, tread softly, that the blind mole may not
Hear a foot fall.”

An external ear to the Mole would have been an appendage continually liable to injury from the intrusion of particles of earth, etc. In accordance therefore, with the peculiar situation of the Mole, it has no external ear; nevertheless, as hearing is essential to its safety, the internal mechanism of the ear is very perfect, and its sense of hearing is remarkably acute. This accounts for the disappointments of persons, who, when seeing Moles throw up the soil, endeavour to get near them, in order to throw them up with the spade, but to their great surprise, when they are advanced near enough to strike the fatal blow, the Mole is gone. The external opening of the ear, which is a simple orifice, is, in a similar manner to



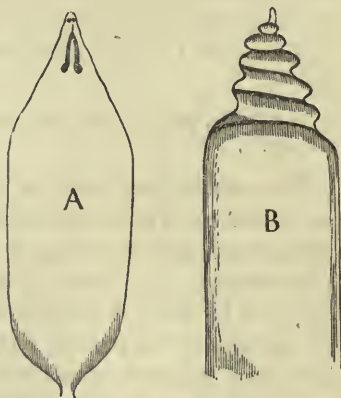
the eye, provided with a muscular apparatus for the purpose of completely closing the orifice, as occasion may require.

The sense of smell is equally delicate as that of hearing, as the latter warns it of its danger the former guides it to its food. How wonderful are the arrangements of the Almighty! nothing is withheld which is indispensable; and nothing is bestowed which is superfluous; or, in the words of Pope:—

“Nature to all without profusion, kind,
The proper organs, proper powers assign’d;
All in exact proportion to the state,
Nothing to add, and nothing to abate.”

The voracity of the Mole is excessive—its sensation of hunger is extreme, by the fact that an abstinence of ten or twelve hours is invariably fatal to it. It is also a great drinker, and its ingenuity is strikingly shewn in the plan adopted for obtaining a sufficient supply. When there is a pond or stream near its abode, a tunnel is made directly to it, if, however, it be too great a distance from such a source, artesian wells, in miniature, are sunk, in which water is always found, and in some soils these wells may be found full to the top. It is also an expert swimmer; we have frequently on summer evenings watched them in the act of bathing and swimming, which they seemed to much enjoy. In its migration it will cross brooks or rivers, swimming admirably; and when spring or autumn floods inundate the fields, it easily saves itself by these means.

Mechanically considered, the body of the Mole is a most perfect boring instrument. The gimlet is in reality a perfect model of this little animal,

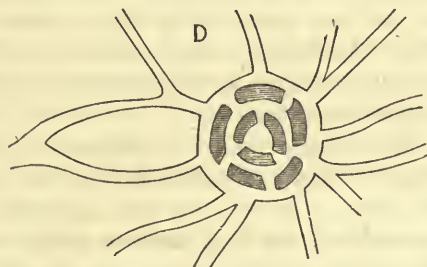


as the annexed sketches illustrate; A, the outline of the Mole, B, that of a gimlet. The body tapers from the shoulder to the nose, which is

almost pointed, and from the shoulder it gradually diminishes to the insertion of the tail. The proportions of the gimlet are exactly the same. The skull is depressed above, elongated and pointed, and the snout continued beyond the maxillary and nasal bones; it is supported by a little additional bone, produced by the ossification of the cartilage. Its boring faculties are rendered still more effective by the ossified condition of the ligament of the neck, which passes from the back to the skull, and which, in other animals is elastic.

The form of the body is admirably adapted for its way of life, the fore part is thick and very muscular, giving great strength to the action of the fore feet, which are broad, bony, and sharp-pointed, (C,) wielded by immensely powerful muscles, forming excavating instruments far superior to the most perfect tools of art, enabling it to dig its way with amazing force and rapidity, either to pursue its prey or to elude the search of its enemies. We have seen it when let loose in a field instantly disappear into the earth, like a ghost through the stage of a theatre, while a most active man with a spade in vain attempted to pursue.

The Mole is not only a miner, but it is an architect of no mean skill, as an examination of its castle will shew. D represents a ground plan, and E a perspective view of its fortress. The exterior of this



castle is a mound very much larger than that of ordinary Mole-hills. Under the centre of this mound is a round chamber, in which our friend spends his hours of repose; from this chamber are three openings leading upwards to a circular gallery; from this upper gallery are five openings

leading to a lower circular gallery of a greater diameter on a level with the centre of the chamber; and from this lower chamber issue eight or ten other passages leading to different parts of the surrounding land, which forms its hunting ground. In forming the main road the Mole regulates its depth according to the solidity of the surrounding soil, and any obstacles, as a road or ditch, that it may have to pass, its depth is there considerably increased; but under ordinary circumstances it rarely exceeds four or five inches. It also pays considerable attention to the proper ventilation of its runs, by leaving small holes for the admission of air. Its time of labour is at an early hour in the morning, yet if everything is quiet it may be observed at work during the day-time, but the slightest sound or movement stops the work. The temperature or dryness of the air regulates its motions, as to the depth of which it lives or works; this is from its inability to bear cold and thirst, but chiefly from the necessity it is under in following its prey, which always descends as cold increases. In frosty weather both worms and Moles are deeper in the ground than in the summer season, and both seem to be sensible of an approaching change to warm weather before there are perceptible signs of it in the atmosphere. When it is observed, therefore, that Moles are casting hills through openings in the frozen turf, or through a thin covering of snow, a change to open weather may shortly be expected. The Mole sleeps more in winter than it does in summer, but it does not become torpid, as some Naturalists have asserted; in fact its appetite is such, as we have before stated, that it cannot wait any length of time without food. Its hunger amounts almost to a degree of frenzy, and when under its influence it is violently agitated, and throws itself on its prey as if maddened with rage.

The Mole has more enemies than it is supposed to have, for though its disappearance from a district is sometimes due to emigration, there are other causes at work to account for their extirpation. They destroy each other in their burrows, for they are exceedingly quarrelsome, the fox and weazel, too, are formidable enemies; but the ceaseless war waged against them by man, the least excusable enemy they have, is the most destructive. It may be observed, that where no efforts have been made to destroy them they do not increase beyond a given number, which varies according to the supply of food, and that their frequent destruction by encouraging the increase of the creatures which are their food, aids indirectly in augmenting their numbers. The female generally brings forth from three to six young, some time in April, May, or June; in the latter month we have frequently found them. The nest is composed of dry grass, old dry leaves, and slender roots.

Varieties of the Mole are frequently found, such as pale yellowish orange,

mouse-colour, cream-white, and pure white, which is said to be particularly common in Poland, and black and white ones, all of which we have frequently met with in various parts of Great Britain.

We have now brought our remarks on the Utility and Habits of the Mole to a conclusion, and sincerely hope what we have advanced as to its utility to the cultivator of the soil, may be the means of sparing many a poor Mole's life.

ON THE SPECIFIC DISTINCTION OF THE BRIDLED GUILLEMOT, (*URIA LACHRYMANS*, TEMMINCK.)

BY THE REV. F. O. MORRIS.

Read before the British Association at the Meeting in Dublin, August 27th., 1857.

IN the study of the science of Natural History, the very first lesson the student has to learn is to attempt to establish no conclusion upon a mere opinion, his own or that of any other person, but to let facts themselves alone guide him to the result. This is plainly the case with regard to questions of specific identity, and naturalists must reverse the analogous motto "*Ubi Scriptura silet, ibi Ecclesia loquitur*," and speak alone with confidence where Nature herself speaks with the eternal and unerring truth of the God of Nature. This remark applies to the subject on which I propose to offer some observations to you to-day—a question in itself of some interest to those who are studious in such matters, and especially so when viewed in reference to one or two other kindred cases, with which it has not, so far I am aware, been hitherto compared. (Since making the above remark, I must here observe that M. Temminck has pointed out, in a passage I shall have occasion to refer to by and by, one of the parallel cases to which I refer, but in ambiguous words which may intend a contrary conclusion.)

There are four British species of the present restricted genus *Uria*. I say four, not as defining the number myself, but as stating the generally-received opinion, with which, however, as I shall presently have to state, I myself coincide, though some, with what has appeared to them sufficient reason, have thought differently. As to two of these species there is no manner of doubt on any side; on these, therefore, I shall offer no remarks. Neither is there any doubt that there is another, a third British species; the question is whether there are two other ones—whether three, or four, in all, or not.

Now, excepting in one main particular, the two species *Uria troile* and *Uria lachrymans* have been described to be exactly alike, or as nearly so as possible. There are, however, some minor differences, which, equally occurring in many other species, may, in such cases, be real specific

distinctions, and that although allied species may possibly at times exhibit the like, as variations from the usual type,—perhaps even exhibit them in these exceptional instances more decisively marked. I allude, with reference to the species before us, to the particulars of size and colour, the common species, *Uria troile*, being by some said to be, if anything, rather larger and rather darker, while by others the *Uria lachrymans* is so described, and the bill rather stouter. This last, though perhaps not a common variation, is certainly a mere variation, as in the instance of the Crossbill, and perhaps in the Nutcracker. And so also with regard to size; the fact is, there are found larger and smaller and heavier and lighter birds in each case. In addition, however, to these there is another, which may be called an “ocular demonstration” of the specific difference between the two species. The eye in this Guillemot, (*Uria lachrymans*,) has been noticed by John Gatecombe, Esq., of Wyndham Place, Plymouth, a very exact and accurate ornithologist, and described in a letter to me, as being considerably larger than in the other. It is encircled by a narrow white band or rim, from which the white line extends backwards and downwards about an inch and a half. This line, from which the bird derives its name, in the Latin, French, and English languages, is the chief apparent mark of difference, the main feature on which its specific distinction has been contended for. It has never, I believe, been imagined to be a characteristic of either sex of the common species, but, on the contrary, is seen in the male as well as the female, in both old and young birds, and that in spring, summer, autumn, and winter.

The question then is, is this a real specific distinction, or is it merely an occasional though perpetually recurring variety, a variety whose range would appear to be defined, the chief station of the bird bearing it being Spitzbergen; while as regards the British coasts, individuals have occurred in every or almost every place where the *Uria troile* is commonly seen.

Now with regard to colour, it will, I believe, be found that, as already mentioned, this species is specifically darker, that is, in old and mature specimens, than *Uria troile*. Old birds of the latter species would seem to become lighter than the young ones; while with the present species, so to call it, the case is reversed, old birds becoming almost black.

Again, the white circle round the eye, and the line of extension from it, has nothing to do with age, for, as remarked in a letter to me from Mr. Gatecombe, the white line is quite distinct in a young bird of the year, in its first winter plumage. Now, in the first place, I do not think that in the case of birds, varieties occur in perpetuity with such exactitude as in the present case, or as they certainly do in insects. *Primâ facie*, if the mark at the back of the head may be so spoken of, it is naturally to be judged that the two birds, the one with it, the other without it,

are distinct. In some species every possible variation of colour and marking exists, as for instance in the Buzzard and the Crossbill, the Ruff and others. Great, too, are the differences in very many species in the summer and the winter plumage; manifold also the shades of pied varieties, from the perfect albino down to the unfortunate bird, sure to be shot, that shews a single "white feather." But I repeat, such variations are of a totally different character from that of the case before us. Here we have a permanent, distinctive, and always uniform mark of difference—"Quod semper, quod ubique, quod in omnibus,"—"semper idem." And, to come to the point to which I have already briefly adverted, we have instances of a precisely similar kind in other species where no possible doubt is or can be, at least none is, entertained. One of these, that to which I have already more particularly alluded, as having occurred to me, is that of the Crow, (*Corvus corone*), and the Hooded Crow, (*Corvus cornix*), which two birds are so exactly or so closely alike in all but the colour of parts of the plumage, that it would be impossible, or next to impossible, to distinguish them by any other than that external mark. True, indeed, their habits are different, the Crow, (*C. corone*), being a solitary bird, only few being at times collected together to feed on a common carrion, while the Hooded Crow, (*C. cornix*), is decidedly gregarious; but not only in an enquiry into specific distinctions do we look first to external or internal marks, and postpone the consideration of the habits, but even these last, if mainly considered (even though there should be a close resemblance,) might very likely lead us astray, as in the case of the Black-backed Gull, (*Larus marinus*), where we find the young bird, the Wagel, collecting together in numbers, but the old birds keeping aloof, singly, or at most, generally, in pairs, seldom more than a pair being seen together. And it is not merely that it is the young birds that thus keep together as the members of a family, for we see many more than these in a flock, the eggs being only three in number, and that without the presence of the parents, as is the case in other continuances of the family union, and, moreover, I believe, until the full assumption of the adult plumage, probably the third year.

In a paper, entitled "Remarks upon the Ringed Guillemot," read before the Natural History Society of Glasgow, by Robert Gray, Esq., and forwarded to me by that gentleman for insertion in "The Naturalist," he quotes from a statement made by J. Wolley, Esq. to the British Association in the year 1850, that in the Ferroe Islands the two species, *Troile* and *lachrymans* breed together promiscuously, in the proportion of one to ten; on which a writer, E. K. B., in a subsequent letter to me, as the editor, observes, that it is left doubtful whether it is meant that the two species breed together actually, or merely in the same situations, a decision of which question would appear to decide the fact, *pro* or *con* the specific

identity or difference of the two species at once—"pares cum paribus." It is however not said which is meant. But, on the other hand, Mr. Proctor, sub-curator of the Durham University Museum, found, during a visit at Grimsey, an island north of Iceland, all three species, *Brunnichii*, *troile*, and *lachrymans* on separate rocks, the eggs being distinguished by the natives, and each of the birds known by them under different names. This latter statement, I may here observe, is corroborated by Mr. Arthur Strickland, who asserts that at Flamborough a few of the *Uria lachrymans* breed, but in places more difficult of access than *Uria troile*, and that the egg is invariably white. Mr. Wolley, on the contrary, has stated that the eggs of the two species, the present and the common one, are not distinguishable.

The late Mr. Macgillivray, in his "Manual of British Birds," speaks of the ring as occurring on *Uria lachrymans* only in summer, and then only in some individuals; but in his subsequent work, the "History of British Birds," he seems anxious to make a species of it. He however asserts that the angle of the lower mandible is farther from the base than in the common species, and more prominent; whereas it has been otherwise described (by Sir William Jardine,) as near to the base, and very slightly developed. Mr. Macgillivray also points out what he considers a difference in the feet, but this is a mere difference in individuals of different sizes.

On the whole then, the conclusion I think to be arrived at is, that neither in the size, shape of bill, or of feet, is there any other but an accidental, or rather temporary, difference between a specimen of the one species and a specimen of the other, these differences existing *invicem* first in one and then in the other, but that the larger eye, and the distinct line from the eye, joined to the wider and distinct rim round the eye, to say nothing of the darker colour, are actual and permanent differences, and mark the species as distinct.

CHARACTERISTICS OF COMMON BIRDS.

BY O. S. ROUND, ESQ.

ALTHOUGH the woods are familiarly associated with Birds as a class of beings in Nature's great family, the connection more properly applies to those which are, strictly speaking, vocal, and with which we are more intimately acquainted; but there are other classes, which are not all perchers, and are far more extensive in their range, and which we must seek for in the air, the wilds, and the waters. Perhaps it may be said, all birds may be found in the air, and so they may, almost all, at some time or other; even the Dabchick, although I never saw him fly,

yet does fly, and I know those who have seen him do so, very like an earwig I should imagine; but there are some whose life is aerial, and when I was a very young student in Natural History, I remember being fully persuaded that Swallows never settled at all, and, except in nesting time, I suppose they seldom do; and Swifts even more seldom still. What a delightful thing it is to sit on a balmy June morning, watching these pretty creatures coursing along just over the grass-tops, and passing so near that you almost fancy you feel the wind they make: at these times you can see them very well, as every bird should be best seen, in his natural element and occupation; what ease and grace in his movements; what elasticity and swiftness; what a glossy back he has, and how he seems to command time and distance: this generally happens when he is taking his chance prey; and you may usually trace when an insect is seized, and hear the snap of the bill. But there are other times, when the herbage teems perhaps with some particular kind of fly, it may be the Small Chaffer, (*Scarabæus solstitialis*,) a winged ant;^{*} at these times you may see hundreds of these pretty creatures, toying about as it were, just among the tops of the bents, and almost dropping down as they seize their prey; and thus you have the best possible opportunity of watching them, for if you sit still, the wild creatures seem, (as probably they are,) quite unaware of your presence as a living thing.

It is a somewhat curious circumstance, that Swallows and Swifts, which are, I suppose, the most aerial birds living, should not be what are ordinarily termed *wild* birds, that is shy, and shunning man's neighbourhood, indeed, so far from it, they build in our very houses, and will come in and out of a barn, a loft, or a outhouse, where people are continually at work, and that even at the common door, or more commonly at some small orifice. I remember very well a pair of Swallows building in the loft at our country house, which had a window looking out on the garden, and in the centre of this window there was an aperture cut of a diamond shape, to let in the light, certainly not four inches any way from point to point, and these pretty creatures would shoot through this hole without brushing a feather, in the most adroit manner.

Now Swifts, as is well known, are particularly fond of small low houses wherein to rear their young, and sometimes where the aperture is somewhat overhung by projecting eaves, they will settle on the wall immediately beneath, and clinging to it so climb in, for which feat their peculiarly-placed toes are very serviceable. I am sorry to confess that in my thoughtless days I have often shot Swifts, because they were difficult to hit, and have almost invariably found the elastic skin of the mouth or gape stored with newly-taken insects, chiefly minute spiders, a store no doubt to be shortly

* Beetle.—F. O. MORRIS.

taken home to the expectant young; and how far might that be, perhaps five or six miles, for this was usually out on the moor, or beside or over a moorland lake, and I knew well that there were no nests much nearer.

Sand Martins are usually less sociable, although occasionally a few pairs do take up a temporary abode near the habitations of man, but these are probably ousted stragglers from some over-peopled community; whilst the pretty Martin is so notoriously attached to society that he is as safe almost as master Cock Robin himself, and it is almost a superstition with the common people, that ill-luck always follows any harm offered to his mud habitation; indeed it is no uncommon sight to see a slanting board placed beneath the nests of these birds, to shoot off what may drop from them, where they may happen to be placed above an alehouse settle, a clear proof of the manner in which they are regarded. There is an instance of this in the village of Guestingthorpe, in Essex, which if not now existing, was to be seen for many years, for we all know how constant these birds are in affecting the same actual spot whereon to construct their pretty nests, and how often they repair anew the inroads that a winter's storm have made.

In rambling about a heathy district, it has always appeared to me that the observer of nature enjoys many advantages; everything around him is wild, so to speak; the creatures whose home is there are more open to observation, he sees them in all phases, and generally in the plenitude of their various natures. Sit still in the soft air of a mild day beside some heathy hillock, and especially if it be evening and you are near some marshy ground, what a variety of studies come under your eye—the king of heath songsters the Skylark, or Lavroek, as the Scotch somewhat poetically term him, after fluttering over the heath-tops with his mate, at length soars upwards amidst the most delightful warblings, until the eye is weary of watching him. If there be a tree near, perhaps a self-sown fir, the Tree Lark humbly imitates his example, singing with out-spread wings as he descends; whilst the Whinchat with his sweet running notes adds yet another charm to the scene. Then in mid-air comes soaring on the Kestrel, with his train of small birds, teasing and dodging him as it were, yet none of these does he seem to regard, as his mode of taking his prey is on the ground, after hovering over it for a short time, although I have seen him pursue a Lark in the air, which, if I remember right, finally escaped him. I recollect on the most unfrequented portion of Bagshot Heath, once witnessing a very interesting and prolonged contest between a Kestrel and a Crow, the struggle being which should get uppermost; the Crow displayed more activity than I could have supposed him capable of, but the Hawk evidently feared coming to close quarters, and although I thought he had many opportunities of striking from above, he did not do

so, and finally after near an hour spent in this manner, the combatants gave up the contest by apparent mutual consent, the Hawk skimming away to one quarter, whilst the Crow eventually settled on a small fir tree, as though to recruit him from his fatigue. I know indeed that as between Hawks and Crows or Rooks, it is generally considered a drawn battle.

If at these times you chance to be on the margin of a bog, it is not uncommon to see the Snipes, as I have often done, running about among the clods, and skipping and fluttering about over them. Like the Moorhens they are indifferent walkers, and appear unsteady in their gait, the tail turning about in a sidelong and curious manner. Pretty studies these for a June morning, at least I always found them so, and many a happy hour have I spent in such contemplations; I can wish no one a greater pleasure, always premising that it is their taste, although like all things to which we ourselves are particularly partial, I am at a loss to discover how it chances that it is not.

Pembroke Square, Kensington, April, 1856.

ON UNITY OF SYSTEM.

(Continued from page 200.)

"THE true goal of science is that towards which it has been moving with unceasing progress since man turned from excursions of fancy, and became an earnest and faithful learner at the footstool of his Maker. Nature to such an one, is not a mere collection of things, of trees, of rocks, and animals, and man, but of living activities harmonious in plan and action."—*Dana*.

In accordance with this quotation, it may be remarked that the facts disclosed by science are far more wonderful than the wildest flights of fancy can feign, and more than compensate for the loss of the latter, for the progress of knowledge proves that truth and fancy cannot co-exist or associate, being opposed to each other.

A few words may be added in explanation of the subject of these notes, in which it is purposed to trace the law of degradation from the beginning to the present time, and to observe its prevalence throughout Nature, and throughout the Bible, and throughout the history of mankind. In the latter part of the Bible, it will be observed that reference is often made and attention is frequently called to the laws of Nature, as they were then known, in illustration and confirmation of the various prophecies, for their mutual agreement was in consequence of their all being parts of, or in subjection to, one supreme law.

The great increase of knowledge and of its consequent necessary subdi-

visions is accompanied by the discovery and application of more general laws to which all this knowledge is subject, and is thus brought within the comprehension of man. All the lines of knowledge during their progress converge more and more together until their final union under one law, and the agreement between them is more perfect in proportion as their advance is equal, but if one of them is stationary while others are progressive, they appear rather to oppose than to illustrate and explain each other. The system of the Bible has not been studied like that of Nature, and this is the cause that the facts of one occasionally seem to contradict those of the other. The laws of God in Astronomy and Chemistry were concealed or encumbered for ages by Astrology and Alchemy, and, in like manner, but to a much greater extent, the simplicity of the Bible has been disfigured by innumerable traditions, from which it is now comparatively free. The eternal life disclosed throughout the Bible precedes and is to succeed the present creation, which, notwithstanding the innumerable ages of its geological periods, is still but

"A narrow isthmus 'twixt two boundless seas,
The past, the future, two eternities."

The course of the visible creation, though ordained for the progressive manifestation of eternal life, yet consists of a series of divergences, in which every part and faculty of the present existence is in turn developed, and recedes in this development more and more from its source, and accordingly after a while, comparatively ceases, in order to make room for or to be transferred to the development of another power. These epochs or developments appear to be successively more comprehensive or higher in degree, and more deeply interesting.

In order that observations on the Unity of System in this earth and in all its creatures, and in its successive and progressive epochs, may be distinct, the outline of the whole design must first be traced, and therefore before proceeding further with the details of the system, I will return to the origin of creation, and will endeavour to shew the purpose of the law of degradation, or rather to notice a superior law to which that one is secondary and final. The Deity, it is said, before the beginning, and previous to all visible creation, fixed for the latter end and for all its parts two states—the first natural and final, the second eternal—and predestined all the epochs and events in nature and in the history of man. The foreknowledge of the number and variety of the creatures, and the pre-arrangement of them in one system, and in subjection to one law and the progress of them all from simplicity to complexity by the successive appearance of new means or elements of power, while the former agents do not cease but are only diminished, claim admiration as much as

the creation of them. He then constituted or designed his existence as Christ as the beginning and end of all nature, or for all the visible creation to attain to, or be filled with, or a standard for the perfection of all creatures. The Deity having thus designed the beginning, created the means or intermediate part, is all the visible and natural objects, and among them this earth, to which our knowledge is almost confined, and of which we know as yet very little, notwithstanding the late comparatively rapid increase of science. And here it may be observed, that a slight accession often modifies or alters the whole of our previous store of knowledge, and this fact may help to explain why our knowledge must cease with our present existence. For this earth is but little when compared with some of the numerous planets which revolve round the sun, and the planets are all very little when compared to the sun itself, and therefore it may be supposed that our knowledge of this earth will be quite changed when it is combined with the knowledge of all these orbs. Again, the sun is but one of the millions, or perhaps infinite number of astral systems in boundless space, and in this fact there is assurance of the endless increase and increasing variety and modifications of knowledge in futurity.

(To be continued.)

NOTES ON THE NATURAL HISTORY OF EAST CUMBERLAND.

BY MR. THOMAS ARMSTRONG.

So wide is the field of Nature, that whatever may be the object of our pursuit, never is it without a season which does not produce something for our gratification and instruction; first the sunny rays of spring usher in the insect and the plant; the lofty hill and feathered tribe announce the season. Next comes summer, when wood and water teem with life: the nightingale pours forth his melodious strains, the blackcap raises his tuneful voice, the wood wren's pitiful call contrasts with that of the piping bullfinch, and the note of the wild and plaintive wood pigeon issues from the sheltered wood; the hum of the early bee, and the falling of the dew-drops, attract the ear, and allured at every step the Naturalist perseveres amidst the foliage of the grove, enlivened by the rays of the sun, and refreshed by the summer breeze.

But friends must part, and so is it with the objects before us: the curlew leaves the mountain, the blackcap and yellow wagtail forsake the dale, the green plover rears her offspring and departs, the whinchat deserts the blooming heather, soon the cuckoo is heard no more; the season is on the wane. Then comes winter, whose productions are comparatively few, but although nature slumbers under its ungenial shades, there is no idle time for the observant naturalist.

The botanist is early in the field; the appearance of his favourite plants tell him to quit the confined city, its drunkenness and impurities, for better and purer air. The wood presents its beauties, is open to every lover of nature, and amidst its solitudes are to be found pleasure and instruction.

Echium vulgare, (Viper's Bugloss,) and *Primula farinosa*, (Bird's eye Primrose,) grow here, the former on Cowran Cut and Armthwaite, the latter plentifully at Durdar. *Paris quadrifolia*, (Herb Paris,) *Genista tinctoria*, (Dyer's Green-weed,) *Genista Anglica*, (Needle Green-weed,) *Carum carui*, (Caraway,) *Veronica scutellata*, (Marsh Speedwell,) at Blackwell.

During this season I have met with *Cardamine amara*, (Large-flowered Bitter Cress,) and *Gagea lutea*, (Yellow Gagea,) in the spring at Armthwaite and Froddell Crook.

Chelidonium majus, (Celandine,) grows plentifully in our lanes; also *Chrysanthemum Parthenium*, (Fever-few,) *Hieraceum sabandum*, (Broad-leaved Hawkweed,) *Filago minima*, (Least Filago,) and *Euphrasia officinalis*, (Eyebright.)

Also on some of our lands grow abundantly *Linum Catharticum*, (Purging Flax,) *Trifolium arvense*, (Hare's-foot Trefoil,) *Briza media*, (Quaking Grass,) *Festuca rubra*, (Creeping Fescue,) and *Gnaphalium sylvaticum*, (Cudweed.)

Ballota nigra, (Black Horehound,) *Stachys annua*, (Woundwort,) *Marubium vulgare*, (White Horehound,) are plants to be found in the neighbourhood of Wetheral; so also may be *Lythrum salicaria*, (Loose Strife,) and *Asarum Europæum*, (Asarabacca.)

(To be continued.)

THE REDBREAST, (*ERYTHACA RUBECULA*, *SYLVIA RUBECULA*.)

BY O. S. ROUND, ESQ.

THIS is a familiar species, which everybody knows, and has probably pitied, if not assisted, when the snow lay thick upon the ground, and food was hard to come by to those who had no stores of winter-food laid up, to resort to when it cannot be had *de horâ in horam*. The Redbreast or Robin, as he is familiarly called, has, time out of mind, been spared by universal consent; and the reason of this would be a difficult problem to solve satisfactorily, although the probability is his familiarity, his boldness, looking so much like confidence, is the chief reason; and, whatever may be the true cause, the idea once having obtained and been received it is not difficult then to account for the sustainment of the fact, for let any one ask himself the question, why he has spared the bird and

regarded it as something sacred from harm, and he will immediately call to mind that the idea has been implanted in his mind from the earliest period, and is about co-eval with his use of a knife and fork, if not of an earlier date.

It is certain that there is no bird more familiar or more fearless, and few, very few, who can at all compete with him in these particulars; it is quite notorious that a Redbreast will come upon the breakfast-table for crumbs, and instances are not wanting where he will come upon the hand of a person who has been in the habit of feeding him, and I saw an instance of this, where a young lady almost daily visited a particular tree, (a small spruce fir,) standing on the edge of the carriage-drive leading to her father's house, and as surely would her little pensioner appear, advance along a particular branch, and hop from thence upon her hand; but although he sat there fearlessly and picked up the crumbs from the palm, he would not suffer the other hand to be advanced towards him, but immediately hopped to a safe distance. I myself induced him to take the bread from my hand, but he would never come upon my hand, but sat on the extremity of the branch and picked the crumbs from thence. A latitude is allowed in all things, and in nothing more than in the nomenclature of colours, which we constantly hear misnamed. Thus, Port wine is called Red wine, and Sherry or Madeira, White wine, and yet we know very well that one is deep ruby, the other gold-colour. In like manner this little bird's breast is called "red," when, if we examine it, we shall find it as nearly ochre-coloured as possible; probably the eye may be deceived by distance and contrast, and the name once given is no doubt all-sufficient as a name, and hence the error was perpetuated. We all know that the kingfisher's breast seems of the brightest orange as he glides over the stream, when, if viewed close, it is not a whit brighter than the Robin's.

It has been said that the reason why we prize the Redbreast so much is, that he is in song when all other music of the woods is mute. This may be, in some measure, true, but let it not detract from the melody of his voice. No doubt everything is enhanced in value by contrast, and the leafless trees, and the thick dull cold air of a November evening, when the light is fast fleeting ere yet the day has seen the eighth hour, set off the sweet piping of this pretty songster to the best advantage; but he really needs not this to place him in the first rank. I suppose it is also partly for the same reason that he passes almost unscathed through the multitudes of devices made use of to entrap and destroy other birds, for it must be acknowledged in fairness to the other kinds, that as a fruit-eating bird he is not less culpable than they; but he certainly does not increase in the same proportion, although his nest usually contains five or

six reddish mottled eggs, and he has often, nay, I may say, usually two broods in the season. One reason may be that it is placed on the ground, and, therefore, more accessible to destruction, although the quantity of young birds seen about in summer almost negative this, and I take the more true reason to be that he is the most pugnacious, perhaps, of any bird, and certainly much stronger than any of his own size. Only catch one, and see if it does not require all your address to hold him in your hand, that is, without such pressure as would injure him. I particularly remember a gentleman taking a fancy to catch a number of adult wild birds, (not of prey of course,) and turn them into an aviary for experiment. The result was that the most furious contests took place, ending in the Redbreast remaining master of the field, and the wren escaping between the wires; for the rest, they fared but indifferently.

It is unnecessary particularly to describe this bird; who does not call to mind his large intelligent eye and finely-formed head, his taper dark legs and pert movements? Like all insectivorous birds, his bill is slender and dark, with linear nostrils, and his feathers fine, with a good substance of down of a dull greyish hue. The red (so called) covers his fore-throat, breast, and forehead, extending round the eyes; the belly is dull white, and at the shoulder of each wing is a small bit of grey, which has the prettiest conceivable effect. The young, until the first moult, differ so much in colour as to be easily taken for some other bird by *ignorami*; but these must be so, however, is very clear, if they do not recognise the shape, the air, and the sharp call-note, by which he is so well known. Spring is the season which most usually calls our attention to the feathered tribes, but this bird seems to remind us, when winter drives away our gay songsters, or makes them silent, that the woods are not entirely deserted, for he is there.

"The feathered flocks,
Which hard bestead by hunger's urging call,
Cast off their shyness, and with crested cock
And all his train, divide the farm-yard spoil.
The Redbreast, to a proverb, bolder yet,
Haunts the abodes of men, for scattered crumbs,
And e'en at open door and window lights,
Or raps upon the pane of casement closed,
With bill importunate; whilst man himself
Respects the confidence, and sacred keeps
The pledge of amity, and spares the bird."

In speaking of the song of this bird, Gilbert White, the Selborne historian, goes somewhat out of his way to meet a position which is scarcely insisted upon, I think; namely, that Redbreasts are autumn songsters; asserting what no one will dispute, that all through the spring and summer their voices are drowned in the general chorus, and in the

autumn only their song becomes distinguishable. He states, also, that many songsters of the autumn are young cock birds of that year, and adds, (which I may refer to in confirmation of a statement I have made above,) that, notwithstanding the prejudices in their favour, they do much mischief in gardens to the summer fruits; (via Letter 60, to Thomas Pennant.)

I have often speculated upon the choice of situations which birds make for their nests; and it is not easy always to come at the reasons for their choice, for reasons we may rest assured there always are, and the more so that they do it blindly; it is an implanted instinct, and proceeds therefore from Divine Wisdom. My theory has always been that food is the great directing agent, and is the best guide to divide animals into *genera* and *species*, and, I think, the general habits are also much affected by it. To apply this:—The Robin builds on the ground, or, rather, in the ground, for he always chooses some sheltered nook, where he may form a sort of cave, usually in the side of a bank, and this he moulds and forms for his purpose, contracting the orifice and making a sort of awning projecting above, which renders it difficult to be seen by the eye from above. Now the Robin chiefly subsists upon worms, grubs, and insects; his habits are sedate, and he is essentially sylvan in his localities, seldom being found out of a shrubbery, and generally within a short distance of a habitation, for in woods far removed from population, I may say, as a general rule, he is seldom found. Lofty trees he seldom mounts, though he occasionally sings from the summit of some moderately tall leader; but still his food, his subsistence, is obtained, and his movements are on the earth, and, accordingly, there he builds his nest. Now with the finches, sparrows, larks, etc., we all know their discursive and arboreal habits, and hence their habitations are in the tall trees of the forest, in the field, or on the waste; but master Bobby is a very neighbourly person, and returns the compliment of our indulgence, by placing himself, as it were, under our protection, and chirping around our very thresholds.

I have seen singular specimens of Robins' nests, placed in very odd situations indeed; in recumbent flower-pots thrown away and lying prone amid the dead leaves, and in corners of old garden-houses, in fact any snug and out-of-the-way place seems just what he likes; he is not very shy, but will suffer his eggs to be handled and his home inspected many times without forsaking it, and when I was a thoughtless urchin I have many a time tried him sorely in this particular. He is a pretty fellow, and although I do not very clearly see why he ought to be spared more than other birds, yet I shall certainly always support so laudable a custom, although not only with respect to him. All I say is, if rats and mice must be killed because they are vermin, and if some birds

sometimes must come within the same category, why I suppose they must; it is a sad necessity, and I do not think that the little fellow we are talking of can ever have such a rule applied to him, at least, I hope not.

Pembroke Square, Kensington, January, 1857.

NOTICE.

A PORTION of the "Naturalist" will in future be specially devoted to the insertion of papers and communications upon Entomology. The great object of this department will be to elicit practical information upon all subjects connected with the science, and the ulterior motive, the result hoped for, will be not only the advancement of this branch of Zoology, but that of exciting an interest in the mind, and thus awakening powers of observation among those who from habit, or natural indolence of character, too often permit their powers of thought and reflection to lay dormant.

Natural History, or the study of Nature in its grand and sublime totality, is indeed a noble pursuit. The beauty of Creation is only half seen so long as we are content to look upon the surface. That combination of rock and mountain, hill and valley, foliage and water, which constitutes fine scenery, is grateful to our feelings, and produces the most pleasing and varied sensations in the mind. And if, then, in the hackneyed but beautiful phrase, we are led "from Nature up to Nature's God," how much more is such a truth realized when we dive into the hidden mysteries of organized beings, and see there a combination of parts—a harmony—a Design so exquisite, so beautiful, so perfect, that the dullest mind must be filled with admiration and awe.

Of this Nature, or Natural History, Entomology teaches us an important part. The structure, the habits, whether good or bad—useful or hurtful—the transformations and the classification and arrangement of all Insects—the study of these things is Entomology.

In this country of Great Britain and Ireland, such a pursuit is mostly limited to the insects of our own fauna. Now this limited sphere of study, while it gives great interest to our insular collections, is rather obstructive than otherwise to the investigation of those higher branches of the science by which the affinities and consequent classification of insects is determined. There are in fact two classes of votaries who worship at the Entomological shrine.—

First—Those who collect and arrange according to the classification of others, who study the habits, changes, food-plants, and localities of larvæ, the time of appearance, the varieties, and the diurnal or nocturnal move-

ments of the perfect insect. To such men the term "scientific" is often denied. They are called "mere collectors," or perhaps "raw recruits," by the wiser and more learned members of the entomological community.

Secondly—Those who study the anatomy and affinities of insects, men learned in many languages, who examine and compare specimens from all parts of the world, and are great in synonymic lore. There are two men who are considered, and justly, to walk in the higher paths of science, for powers of abstraction and generalization are the requisite accomplishments for such a position. They write much Latin in defining the characters of insects, and indite long papers upon abstract points of difference in the Entomological economy. They are the men to whom the rewards of fame fall due. With all these perfections they have one fault; they are apt to look down with something akin to contempt upon the hard-working Naturalist of the woods and fields.

With due deference, however, we are inclined to think such a division of classes is not normal. It does not in reality exist, and when we find that the distinction is anywhere prominently insisted upon, we may be quite sure that pedantry or affectation is the spring by which the movement is made. The practical Entomologist works quite as hard, if not more so, than the man who collects facts in his study. Linnæus, Kirby, J. F. Stephens, Curtis, and a host of others, have earned their well-deserved reputation as much in the field as the closet. The "*Fauna Suecica*," the "*Systema Naturæ*," the "*Introduction to Entomology*," the "*British Entomology*," and the "*Illustrations*," are the splendid legacies of men who sought Nature as she exists in her own garments of exquisite beauty.

It is to the men, therefore, comprised in our first category, the "mere collectors" of some, the "practical Entomologists" of others, to whom we look principally for support in this our new venture in the cause of scientific truth. We do not in the slightest degree wish to enter into the field of opposition with any existing journal, we would not, if we could, touch the well-earned prosperity of our Natural History periodicals, but we wish to be supported by those who look upon Entomology as a pure mine of science, to be worked by men who will do so for the love of that science alone. We wish also to see the tone in connection with one very interesting and important branch of Entomology, the most popular, perhaps, of all, raised far above that which obtains at the present moment; and this can only be done by the determined union of men of high and honourable feeling, who will never permit the temple of science to be profaned. We need not make further allusion to a subject well known to the collectors of Lepidoptera, but which we trust we may now banish from these columns for ever.

Brighter far is the thought which now for a moment directs our attention

to a class of Entomologists to whom we wish to say a few words, namely, the incipients, as they are termed in the parlance of the day. To those we trust we shall always be a friend. We shall not flatter them by publishing ill-digested or useless communications, but we shall do all we can to set them in the right way—to encourage them in their difficulties, and by holding up to them as examples those who have gone before them, and who by steady perseverance have won fame and renown, we hope that our efforts to keep them in the true path will be crowned with success. To those who are more advanced—to the adult and aged student of Nature we appeal with confidence. Had we any other interest than that of the advancement of science, we should scorn to make any appeal at all. Science never progresses when its advocacy is made subservient to private interests or book-trading monopoly. It must be free and unshackled. The great object of all science—that of giving knowledge to the ignorant, of enlarging the mind, of exciting thought, and forming habits of observation and reflection, must never be lost sight of. To this end simplicity of language is all-important; we must not make doubtful laws, and illustrate our assertion by long, hard words. The thirst for knowledge is often at once and for ever slaked by the cumbersome language of pedantry. Science itself is pure and simple. It is merely the study of those laws which the Omnipotent Creator in the world's early morning impressed upon all things. In revealing these laws we are unfolding to the lower human mind the Greatness, the Wisdom, the Power, the Harmony, and Goodness of the one Greater Mind which designed Creation.

And only so far as such revelations impress upon us an exalted feeling of gratitude can science be of benefit to mankind. Once let the lower usurp the place of the higher mind, and all our efforts to be useful will from that moment cease.

C. R. BREE.

Strickland, Sept. 15th., 1857.

NOTES ON CRUSTACEANS.

BY W.

Lithodes Maia.—This beautiful species is pretty common: on March 1st., and May 21st. and 26th., specimens came to hand. It inhabits rocky ground at a considerable depth. It seems somewhat strange that almost all the specimens were incomplete, some wanting one leg, some two, and some more.

Carcinus Mœnas.—On September 12th. I found many of this species with the carapace quite soft. They were very languid, and made almost

no attempt at resistance when taken hold of. They kept the legs quite close to the belly, instead of throwing them up in their usual attitude of defence. Some time ago a monstrosity was found; it had four fingers on one hand; the superfluous two were growing from the side of the normal two. About the same time one of *Cancer pagurus* was got with three fingers on one of the hands.

Stenorynchus Phalangium.—On October 19th. a specimen came to hand with zoophytes attached to the legs, not growing on them; the pieces looked as if bitten off, and fixed by means of the bristles of the legs. The crab seemed to have lately cast its shell, and was again getting on its clothing of sponge, zoophytes, etc. Mr. Bell, in a note at page 24, seems to contradict Say, who gives it as his opinion, that the pieces are mechanically entangled by means of the hairs. He says:—"There is no doubt that they actually grow upon them, and are attached by roots." I have found them without doubt growing, and also without doubt "entangled mechanically in the hooked hairs." May not a few pieces be at first attached, and then become rooted, and propagate till the whole animal is covered? Why should the slow-moving crabs have this covering? It seems likely to serve as a protection from their enemies, by rendering them of the colour of the ground they feed on. Is not this the case with many, if not all kinds of fish? They take their colour from the nature of the locality they frequent. Thus I have found small cod quite red when caught among the forests of *Laminaria digitata*, etc.

Hyas coarctatus.—October 13th. brought a female loaded with spawn, which is of a yellow colour. On November 6th. another completely covered with zoophytes growing on it, with some pieces of *Flustra* lying horizontally, was got; it was also loaded with spawn.

Portunus holsatus.—October 18th. added a fine specimen of this beautiful crustacean; it was taken from a cod's stomach. A few days later another specimen was detected in the stomach of a fish hooked in forty-five fathoms of water, about nine miles off; the bottom was rocky.

Portunus pusillus.—From the numbers taken from cod and haddock stomachs, they seem to swarm on the rocky parts of the Frith.

Inachus Dorsettensis.—About the same time great numbers of this species were turned out of cods' stomachs; they were almost all entirely covered with *Balani*, some of which were of very large size. This species does not cast its shell yearly, or else the growth of the barnacles must be astonishingly rapid,

Ebalia Bryerii.—Seems to be most abundant in deep water, from the remains found in stomachs.

Ebelia Pennantii.—October 24th. several specimens were taken from haddocks' stomachs, caught on rocky bottom in forty-five fathoms of water.

Eurynome aspera.—Was found in a stomach from the same place; this crab is very rare.

Inachus leptochirus.—January 17th. brought to light a specimen of this "extremely rare" crab. It was found in a cod's stomach, hooked in thirty fathoms of water on muddy bottom.

Hyas araneus.—March 9th. a specimen, carrying spawn, was found dead on the beach near Macduff.

Macduff, March 12th., 1857.

THE NATURALIST'S WISH.

THEY tell me of those fairy isles,
That far away from here,
Rise in the Southern Ocean,
From the waters bright and clear;
Where birds of gaudy plumage
Flit from tree to tree,
On branches never leafless,
Bending o'er the sea;
Where the dark and swarthy savage,
In Nature's garb arrayed,
Reclines in easy posture
Beneath the cocoa's shade;
Where the sun is daily coursing
Through the blue and lofty sky;
Where no sorrow or repining
Brings forth the solemn sigh;
Where all is joy and gladness,
And money is not known,
To tempt the heart to evil—
To visit Satan's throne.

Oh! let me live in such a land,
In some retired spot,
The world by me forgotten,
My name by the world forgot;
And there I'll study Nature's works
Made by a hand sublime,
So wonderful and lovely,
In that far-distant clime;
And every bird and every beast
Shall share my happy lot,
And never will molested be
Around my pretty cot;
And night and morn my lips shall move
In heartfelt adoration,
To bless that God who gave me sense
To study His creation;
And when the hour of death draws nigh,
My only wish shall be
To be buried beneath the cooling shade
Of some wide-spreading tree.

JOHN AP JOHN.

North Wales, July, 1857.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 206.)

Felis domestica hispanica, Schinz.
Felis catus angorensis, Schinz.
Felis domestica chinensis, Schinz.
Felis brevicaudata, Schinz.
Felis Manul, Pall. Reich. Schinz.
Felis catus ferus, Schreb. Buff. Pall.
Temm. Desm. Schinz.
Felis Lynx, Linn. Schreb. Tem. Schinz.
F. Lynceula, Nils.

Felis pardina, Temm. Cuv. Fisch. Wag.
Schinz.
Felis cervaria, Temm. Nils. Cuv. Wag.
Schinz. *F. Lynx*, Pall.
Felis virgata, Nils. Schinz.
Felis borealis, Temm. Cuv. Schinz. F.
canadensis, Desm. Griff. Rich. Har.
Felis rufa, Gld. Schreb. Tem. Desm.
Fr. Cuv. Schinz. F. maculata, Horsf.

Felis maculata, *Horsf. Reich. Schinz.*
Felis fasciata, *Schinz.* *Lynx fasciatus*,
Rafn. Lewis, Natt. Beech. Har.
Felis Caracal, *Schreb. Cuv. Desm. Tem.*
Fr. Cuv. Wag. Schinz.
Felis Chrysothrix, *Temm. Schinz.*
Felis moorinensis, *Hodg. Schinz*
Felis yaguarundi, *Desm. Temm. Reng.*
Schreb. Schinz. *F. Darwini*, *Mart.*
Felis Eyra, *Desm. Reng. Griff. Schinz.*
F. unicolor, *Trail.* *Eyra Azara*,
Fisch. Wag.
Felis Pajeros, *Desm. Water. Schinz.*
Azara essays, *Fisch. Wag.*
Felis colocolo, *Smith. Schinz.* *F.*
strigilata, *Wag. Cuv.*
Felis megalotis, *Mull. Schinz.*
Felis Temminkii, *Vigors. Schinz.*
Felis planiceps, *Vigors. Mull. Schinz.*
Felis Guigna, *Schinz.* *F. tigrina*,
Linn?
Felis nigripes, *Burch. Schinz.*
Felis neglecta, *Gray. Schinz.*
Felis Ogilbyi, *Schins.* *F. servalina*,
Ogil. F. brachyura, *Wag.*
Felis chinensis, *Gray. Schinz.*
Felis inconspicua, *Ogil. Schinz.*
Felis Tigrillo, *Pöppig. Schinz.*
Felis rutila, *Schinz.* *F. rutilus*, *Water.*

Felis Geoffroyi, *Guer. Schinz.*

FAMILIA III.—PHOCIDÆ.

OTARIA.

Otaria jubata, *Desm. Schinz.* *Phoca*
jubata, *Schreb.* *Platyrrhynchus leo-*
ninus, *Less.* *O. Pernettyi*, *Less.* *P.*
leoninus, *Fr. Cuv.*
Otaria Stelleri, *Less. Schinz.*
Otaria californiana, *Schinz.* *O. cali-*
forniana, *Less.*
Otaria ursina, *Schinz.* *O. ursina*, *Desm.*
O. Kraschennikofii, *Less. Fisch.*
Phoca ursina, *Linn. Schreb.* *Ursus*
marinus, *Stell.* *Artocephalus ursi-*
nus, *Less. Fr. Cuv.*
Otaria Forsteri, *Less. Schinz.*
Otaria flavescens, *Desm. Pöppig. Shaw.*
Schinz.
Otaria albicollis, *Desm. Per. Less.*
Schinz.
Otaria cinerea, *Schinz, Desm. Per.*
Fisch.
Otaria australis, *Schinz.*
Otaria pusilla, *Schinz.* *O. Peronii et*
nigra, *Desm. Schreb.* *O. Peronii*,
Griff.
Otaria falklandica, *Schinz, Desm.*
Griff. *O. Shawii*, *Less.*

(To be continued.)

Miscellaneous Notices.

Wood Pigeon.—I saw a Wood Pigeon to day at Londesborough, flying with a large stick in its bill for building a nest. It is not often that the second brood will be so late as in this case it must be.—F. O. MORRIS, August 23rd., 1857.

The Wren.—A pair of these birds have lately built what must have been a second nest this year, and the other day, the 2nd. instant, there were four of the young ones, barely able to fly, perched all together on a wire garden chair, close to the Rectory here. I caught one of them, a "bonnie wee thing," and kept it for a few minutes. It was a very pretty sight to see them all together, "a large small family."—F. O. MORRIS, August 2nd.

Fall of a House.—A swallow built her nest inside the roof of our

summer-house. One fine (or probably wet) day or night, the nest and all that it contained fell down, but the fall was partly broken by a table on the middle of the floor. It proved only to have one young bird in it, nearly fledged. The parent, or parents, continued to feed it in this situation, and in due time it became able to fly, and got away.—F. O. MORRIS, Nunburnholme Rectory, August 17th., 1857.

Clouded Yellow Butterfly, (*Colias edusa*.)—I had the good luck this morning to capture a fine specimen of this butterfly, and saw another but lost it. I have never heard of nor seen it in this district before, and I see from Mr. Morris's valuable work on "British Butterflies," that it is rare in Scotland.—W. G. GIBSON, Dumfries, August 17th., 1857.

Xanthia Silago.—On the 5th. of August, Instant, Marmaduke C. F. Morris found a fine specimen of this moth in our orchard. This date is, I fancy, an uncommonly early one for its appearance; the usual time seems to be not until September.—F. O. MORRIS, Nunburnholme Rectory, August 17th., 1857.

Four Days' Collecting in the Neighbourhood of Dorking.—July 5th.—In addition to those already mentioned in the August No., I took *Helveola*, and eight larvæ of *Verbasca*, (The Mullen.) 11th.—Forty-eight *T. pastinum*, (Black-neck;) six *Helveola*, (Flat Lackey;) two *Russula*, (Clouded Buff;) twelve *Angustalis*, (Silver-dotted Nettle Trap;) six *Cacimaculana*; four *Cespitana*; and eight larvæ of *Lychnitis*. 18th.—Ten Black-necks, fifty Flat Lackeys, four *Abietaria*, (Satin Carpet;) four Willow Beauty, six Tissue, and twenty-four larvæ of *Lychnitis*. 25th.—Forty-eight Flat Lackeys, six Satin Carpets, and fifteen larvæ of *Lychnitis*.—JAMES GARDNER, 52, High Holborn, London.

T. allantiforme, (White-Belted Clear Wing).—I have just added a fine specimen of this insect to my private collection, which, I believe, is the fifth specimen known. Possibly some of the readers of "The Naturalist" could enumerate more. Stainton's "Manual" only records a single capture.—Idem.

Butterflies.—The present season is very prolific in insect life. Seldom have we seen the Peacock Eye and Red Admiral in such abundance in this district. A specimen of the Clouded Yellow, (*Colias edusa*), was captured a few days ago in Kirkmahoe; and on Tuesday seven were taken, and a good number more seen, near Gleneapple Quay. As there is only one recorded capture of this "Favourite of Entomologists" in Scotland, we hope some of them may escape the ruthless net of the collector; and we may soon be able to look on it as one of our local species.—*Dumfries Herald*, September, 4th., 1857.



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O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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NOTICES TO CORRESPONDENTS.

Communications have been received from Messrs. G. R. TWINN;—O. S. ROUND, (two);—G. HODGE;—R;—T. LISTER;—F. M. BURTON;—C. R. BREE;—D. PAYNE;—S. P. SAVILL;—C. H. BROWN.

ENTOMOLOGY.

A. B.—Many thanks: any information about the Coleoptera will be acceptable. We hope soon to have a list of the rarer species taken in Suffolk.

MR. TWINN.—We are much obliged by your paper on the "Humming Bird Sphinx," but as it relates to an insect very common in the South of England, and the habits of which are well known to Entomologists, we do not think any good purpose would be attained by its publication.

* * All communications on Entomology intended for insertion in this department of "The Naturalist," must be sent before the 15th. of the month to C. R. BREE, Esq., *Stowmarket, Suffolk*.

ERRATA.—By an inadvertence we had not an opportunity of correcting the proof of the "Notice" in last month's number, we are therefore under the necessity of requesting our readers to make the following alterations in that article:—Page 230, sixth line from bottom, for "*is determined*," read "*are determined*." Page 231, sixth line from top, for "*There are two men*," read "*These are the men*."—ED.

Communications, Drawings, Advertisements, etc., to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York;—Books for Review and Parcels, to the care of Messrs. GROOMBRIDGE, 5, Paternoster Row, London.

TO ADVERTISERS.

Advertisements are inserted on the Cover of THE NATURALIST, on the following Terms:— $\frac{1}{5}$ of a page, 4s.— $\frac{1}{4}$ of a page, 7s.— $\frac{1}{2}$ of a page, 12s.—Whole page, 21s. Bills stitched in, 20s.

Advertisements to be sent in not later than the 15th. of the Month.

THE SONG OF BIRDS.

BY O. S. ROUND, ESQ.



EVERYTHING has a peculiar characteristic, or that by which it is particularly distinguished; thus the song of birds is their distinguishing attribute, and in the universal possession of which (I speak of *song* birds) they differ from all other creatures, the human race not excepted. This gift has in all ages formed the theme of the poet, the charm of the country, and the admiration of all; it is simultaneous with a genial change of season, and ushers in the first warmth of April's sunbeams in the most agreeable manner. I think no one, let him be ever so insensible to the beauties of Nature, but must have felt the full effect of the charm of this delightful harmony; for, let the season be what it will, sunshine alone calls it forth in full chorus, and what can enliven a brilliant day, and add zest to the enjoyment of it, more than this sweet accompaniment? It is true that the woods, robed in their new dress of light green foliage, are a beautiful spectacle; but were they silent, they would charm only without inspiration, whilst the native music that resounds amid their branches animates the scene in an uncommon manner, and seems to enhance even the brilliancy of the hues which are blended in the sea of leaves. It is a remarkable circumstance that, almost without exception, the plainest-looking birds are the best songsters, as if Nature designed to make up for their want in one particular by their excellence in another, in the same manner that we constantly find the most ordinary persons the most agreeable, and splendid talent incased in a receptacle of deformity, the only difference in the analogy being that both are often mingled in the human subject. Hence it seems ordained that one is formed to please the eye, and the other the ear, so that the pleasure received by two senses may not be called forth by the same subject, as though they might interfere and clash with each other. Look at the magnificent Peacock, the Eastern Pheasant of the Himalayas, our own Pheasant, or the native of China, with their gorgeous and dazzling contrast of resplendent plumage; all these are harshly loquacious, and, if not, comparatively mute. The Kingfisher is seldom heard to utter any sound, and when he does, it cannot be called even a note, and is only agreeable as connected in memory with the cool, flowing river, and the refreshing shade of the willows in a summer's day.

Look at the beautiful Swan as he sails majestically upon the bosom of the waters, what can be a more noble sight? and yet this stupendous bird, for there are, I believe, very few which exceed him in size, when with flashing eyes and out-spread plumage he resents an insult, becomes suddenly almost ridiculous when you hear nothing but a "hiss" proceed from him.

The Hawk tribe, again, beautiful and symmetrical as they are, so formed, so exquisitely shaped for rapid and nervous motion, utter nothing but a shriek, and yet is their wild cry peculiarly adapted to their nature, and sufficiently characteristic. Then there is the Heron tribe, which have all, more 'or less, harsh sounding notes, partaking more of a scream than any other sound; but these are partially nocturnal birds, that is, return late to their rendezvous, and wake the far-drawn echoes of the valleys as they wing their solitary way homeward.

Most night-birds are clamorous, for although it is true that their eyes are so formed as to collect every ray of light, yet we cannot suppose that they can do more than see somewhat better than ourselves in the dark, and hence this is absolutely necessary to collect stragglers. The cries of water-birds are more similar than those which inhabit the earth, for among them are *no* songsters properly so called. Many have curious, and perhaps not inharmonious notes, but they either partake of a monotonous whistle, a shrill cry, or a harsh quack! The Hooper, or Wild Swan, particularly, makes a loud sound, very much like the turning of a rusty hinge, (as I have elsewhere observed;) and the Thiek-kneed Bustard, or Stone Curlew, utters three notes, executed as a turn, reduceable to music; but these are the only peculiar instances that occur to me at the present moment.

All birds, as I have observed at the outset of this paper, are possessed of melodious notes, or the capability of uttering such, but it is to the *land*-birds that this observation more peculiarly applies, as amongst them we have the finest singers, and indeed the only true songsters, of which no country in the globe can boast so many as our own; for I think we may fairly call our summer visitants ours, inasmuch as they perform the most important function of their lives, namely, nidification, with us, and very many of them, we may fairly conclude, although they leave us after being bred in England, never reach other shores, amid the waste and destruction which their transmarine journey must necessarily cause, especially to young and consequently imperfect flyers. Now among these we rank the Nightingale, that divine songster, whose mellifluous notes have formed the theme of song and admiration from the earliest ages of antiquity; never, I suppose, did poet write without celebrating her song, and it is indeed well worthy of the most exalted praise which can be bestowed upon it; there is a richness, a volume in it, which causes you to look with pleasing astonishment at the little throat which pours it forth.

“Whilst fair Lucinia, in her russet garb,
Unseen, from deepest nook, pours forth her lay;
Whose liquid notes swell on the silent air,
With richness, fullness, sweetness, unsurpassed,
If ever equalled, whilst the spell extends

To every ear, and thence to every heart,
 Till all confess the power of music's charm,
 And the fair songstress, first of all the choir,
 That carol forth their lays from morn till night."

Then there is the Blackcap, that charming singer, called also the English Mocking-bird, although I have always thought that his native powers, bearing as they do a great resemblance to the notes of other birds, are, *ab initio*, his own. The Thrush is another superior songster, and it is difficult to say that any but the Nightingale can be placed before him, his notes are so extremely varied and powerful, although necessarily often repeated; but there are those who prefer the Blackbird, and I own as to *tone* I am of the number, fully awarding, as I do, the second place to the sweet *Mavis*. Then comes the Redbreast, which "comes out" so sweetly in sunny December days; the Wren, that noisy little thing, who almost rivals the Canary in power; the Redstart and Whitethroat, those delicate songsters; and the rest of the *Insectivori*, all, more or less, real songsters, especially the little Willow Wrens; even the fairy-like golden-crowned Wren adds his sweet minute voice to the general chorus. Then the Finches are all singers, and very prettily some of them sing; the Chaffinch is particularly well known, as he has a powerful round-toned voice; but the Goldfinch much surpasses him in sweetness and variety, but is comparatively insignificant and unheard for want of power, and these with the Bullfinch are really all pretty birds as well. Then that pretty little bird the Reed Wren, Gilbert White's *Salicaria*, (how the idea reminds me of Selborne;) how sweetly she awakes the echoes of night with her hurrying and varied song, which is a very sweet polyglot. She and the Nightingale are charming soothers of the summer midnight; and many a time have I enjoyed a half-hour when waiting for a late up-train in the neighbourhood of London, under the soft light of a bright moon, and drinking in with silent satisfaction the song of both these pretty creatures. The Cuckoo too, although he only utters two notes, is still entitled, from his strength of voice and its pretty combination and true melody, to a foremost place amongst singing birds; even the little Hedge Sparrow is very pleasing in the solitude of the wood.

Very few foreign birds are good songsters; America, I believe, boasts the best in its "mocking" Thrush, for although the Parrot is very capable of producing almost any note of music, it is in the way of imitation, and not his own natural song. There are a great proportion of the finch tribe, of the foreign kinds, which have one loud whistling note; of this the Virginian Nightingale is a familiar example.

Whether we call the note of the Domestic Fowl singing I am dubious, although their tones are very varied in expression. These are also foreign

birds, and find their originals in the jungles of India and the regions of Java. The Woodpeckers cannot be called singers, although they have a loud laughing note enough; but among the very small birds we have some beautifully sweet voices, thus the Linnets, the Titmice, the Swallows, the Wagtails, the Stone and Whinchats, are pretty songsters, and the Wheatear; and what can add to the enjoyment of the purity of the air on the moor more than these sweet sounds, as they come upon the air borne amid the hum of wings? Even the Buntings, although not strictly harmonious, have still a modified song. Then the Sky Lark and Wood Lark are beautiful songsters, especially the latter, for there is a delicate sweetness in his notes, albeit, the Sky Lark has a splendid voice; the Bullfinch too is a fine singer, that is, his natural notes are few, but, as we all know, he is capable of being taught to execute complete airs. Even Owls hoot in a particular key, and I doubt not but that the Raven and Bittern have some fine bass notes.

It is the Pie, Thrush, and Parrot kinds that chiefly learn to articulate words, indeed I believe the only ones; the Starling having in some instances attained to great proficiency in this particular, and there have happened one or two cases of talking Canaries, but these were considered such uncommon rarities as to be valued at the most enormous price.

The song of birds is so exquisitely adapted to set off their soft aspect amid the boughs of the forest or the sprays of the hedge-row, that no other accompaniment could render them so charming. It seems to communicate a double degree of elasticity to their motions, and creates a joyousness in the scenes of nature which I am persuaded nothing else could so well supply. It is impossible in the limits of a single paper, to do more than touch upon the different varieties of songsters, but perhaps at some future period, I may enter into a more minute comparison of the various species as regards their vocal powers.

Pembroke Square, Kensington, April, 1856.

ON THE CLASSIFICATION OF THE ANIMAL KINGDOM, BY THE DISTRIBUTION OF THE NERVES.

BY F. M. BURTON, ESQ.

(Continued from page 210.)

No. V.—PART II.

IN the third great class of the Vertebrate division, that of birds, we find many interesting organic changes and developments, the principal of which, says Professor Jones, after the improvement in the condition of the nervous

system, is the elevated temperature of the body, and the heat of the circulating fluids. The skeletons of the animals which belong to this class being formed for flight, of course differ widely in their mechanical construction from those we have yet considered. The bones throughout are eminently fitted for the purposes for which they are intended, uniting the greatest strength and firmness with the lightness indispensable for the due exercise of their powers. The muscular system is also necessarily very highly developed, and far exceeds that of all the classes we have hitherto considered, with the exception of insects, which are also adapted to flight.

The mouth consists of a variously shaped beak, in no instance provided with teeth, enclosing a stiff bony tongue, which is used for widely different purposes in different species. The *oesophagus* is provided, in most birds, with a crop for holding the food previous to its entering the stomach, and a second dilatation, called the *bulbus glandulosus*, situate just at the commencement of the gizzard for the gastric juice. The gizzard itself is of immense strength, and its crushing powers are assisted in some birds by small pebbles which they swallow for the purpose. The length of the intestinal canal varies considerably in different species, and its division into small and large intestines is not very distinct. The auxiliary secreting glands consist of the salivary, placed immediately beneath the mucous membrane of the mouth, the gastric already spoken of, the liver and pancreas, which are of a considerable size, and the spleen, which is always very small. This class also possesses a peculiar external gland for secreting oil for lubricating the feathers, which is especially useful to those species that inhabit the water. The respiratory and circulatory systems are much more highly developed than in any class we have yet considered.

The heart is divided into four distinct cavities, two auricles, and two ventricles, one of the latter transmitting venous blood to the lungs, while the other drives the arterialized portion to all parts of the body, the atmospheric air being not only confined to the lungs, but resembling somewhat the action of the tracheal tubes in insects, it permeates all the interior of the body, and penetrates even into the bones. The lungs are no longer confined in closed bags as in reptiles, but resemble spongy vascular masses, which are bound down to the dorsal aspect of the thorax, and are incapable of alternate dilatation and contraction, the air being distributed through the substance by the introduction of innumerable branchial tubes, the main trunks of which passing through the lungs, open by wide mouths into the thorax, whence the air is transmitted to all parts of the body, an arrangement wonderfully adapted to the requirements of the feathered tribes, as by the abundant supply of pure air, the blood is at all times highly oxygenized, the specific weight of the body is considerably lightened, and those that are endowed with the gift of song, are enabled by the same means to

produce and prolong those notes of music which in the spring and early summer months, and even in the warmer winter days, may be heard enlivening our woods, lanes, and hedge-rows. The kidneys of birds are always of a large size, and the generative system is quite as simple in its structure as that of reptiles.

The young, while confined in the egg, pass through many most wonderful and interesting changes, or rather gradual developments, as regards heart, lungs, and circulatory apparatus, before they are hatched and make their first appearance in the world as highly organized members of the Vertebrate division of the Animal Kingdom.

The nervous system, in accordance with the never-failing rule, presents a very perceptible improvement in comparison with that of reptiles, more especially, says Professor Jones, "in the increased proportional development of the cerebral hemispheres;" but it is still inferior to that of the highest class next to be considered in several important points. The senses of touch and taste are but imperfectly developed, while those of smell and sight are, on the other hand, very highly brought out, to enable the birds to scent the least waft of carrion that may taint the atmosphere, and to discover the lurking prey while sailing at a great distance above, or gliding quickly through the air. The eye in birds is admirably constructed, and is provided with three moveable eyelids—an upper, and a lower, and the nictitating membrane, which is in a measure transparent, and the lacrymal and other glands. The sense of hearing in birds is like that of the more perfect reptiles, there is still no external ear, though the owl tribe possess a broad sinus flap, which somewhat resembles the more highly-organized auditory apparatus of the next class.

We now come to the last class of the animal world, at the head of which stands man, as far pre-eminent over all the tribes and genera below, as his nervous system exceeds theirs in perfection. One of the great distinguishing characteristics of this favoured class, and one which is never met with in the lower families, is the production of milk for rearing their young. Their skeletons, which in man and all other mammals except cetacea, are divisible into five parts,—the cervical, dorsal, lumbar, sacral, and caudal, are of endless variety and shape, and always singularly and perfectly adapted to the circumstances of the different species to which they belong.

The more we examine the principles of nature, the more must we be convinced of the consummate wisdom of its divine author, and this is nowhere more strikingly displayed than in the formation of the skeletons of the different tribes of mammals; as, for instance, the disproportionate size of the hind legs, and length of tail of the kangaroos, fitting them to escape when pursued, by strong and vigorous leaps; the conversion of the

anterior extremities of whales into broad fins and paddles, enabling them to move through the waters of the sea with as much ease as the most perfectly organized fish; the elongation of the metacarpus of the horse; the remarkable shape of the skeletons of the sloth tribe, adapted to their existence amongst the branches of trees; the elongation of the fingers of bats, whereon their membranous wings are stretched; and many others, the enumeration of which would occupy too much space.

The transition from birds to quadrupeds, says Professor Jones, is effected by gentle gradations of structure, and the Monotremata, of which we have a familiar example in the Duck-billed *Ornithorhynchus paradoxus* of New Holland, forms the lowest connecting link. The muscular system of mammals is in general very variable and highly constructed. One of its distinguishing features is the diaphragm or muscle, which divides the thoracic from the abdominal cavity, and is peculiar to the entire class. Another important one is the cutaneous muscle for moving the integument, which, in some species, as the porcupine and hedgehog, is very highly developed. In man this muscle is found only partially adapted to different offices of the body. Their digestive system is very variable and complex; the teeth, which arm the mouth, and seize and masticate the prey, are a study in themselves alone. Those of whales, forming the whalebone of commerce, are of a horny texture, and hang in fibres from the roof of the mouth, straining the waters of the ocean as through a sieve, and catching thousands of mollusca and other animals in their net-like fringe. The male narwal, instead of the usual teeth planted round the jaw, possesses a single tusk of great strength, attaining sometimes the length of eight or ten feet. The tusks of the well-known elephant offer another remarkable modification of the dental apparatus, and consist of ivory without enamel. But in far the greater number of quadrupeds the teeth present a more complex structure, consisting of two distinct substances—ivory and a coating of very hard enamel; some continue to grow during the life of the animal, as the incisor teeth of rodents; while others are limited in their growth, as those of man, the carnivora, and others.

The tongue, the seat of the sense of taste, corresponds in all mammals in general muscular structure to that of man, with the exception of the ant-eater and others which use it as a means of capturing insects, and have it adapted accordingly to the purpose. In some animals this organ is studded with recurved points; in the porcupine it is armed at its extremity with sharp horny scales. The salivary system in all mammals, where it exists, corresponds generally with that of man. In the amphibious genera it is but feebly developed, and in the cetacea it is not found at all. The œsophagus is a long muscular tube, with a loose lining membrane, capable of great distension; and the stomach, which is of endless

variety and shape, is either simple, as belonging to the greater number of mammals, complex, made up of several communicating compartments of a similar organization, as in the kangaroo, poreupine, etc., or compound, as that possessed by the ruminants, or animals which chew the cud, consisting of four distinct cavities of a different organic construction. Some animals, as the camel and dromedary, that have to subsist many days without a fresh supply of water when journeying over the desert, in addition to these cavities, have deep bags or reservoirs where water may be retained without mixing with the contents of the stomach. The rest of the alimentary canal in most quadrupeds is divided into small and large intestines, the division of which is marked by cæcal and vermiform appendages, or by an internal valve, as in the sloth and armadillo tribes.

The remaining viscera, the chyliferous and the lymphatic system, as well as the circulatory and respiratory organs, correspond in their general development with that found in man, breathing being effected by the alternate motions of the diaphragm and thoracic cavity, and the heart, which offers the same arrangement throughout the entire class, consists of two auricles and two ventricles, the arterialized blood being collected by the pulmonary veins into the left auricle, and being expelled from its corresponding ventricle through the aorta into the general structure, and thence again collected by the venous system through the *venæ cavæ* into the right or pulmonic auricle, and its corresponding ventricle, to be again passed on as before.

The skin of all mammals consists of three parts,—the cutis or true skin, the epidermis or cuticle, and a thin layer of pigment between the two, and the hair and other epidermic appendages with which it is clothed, although apparently of very diversified structure, always consist of the same material in a more or less modified state. The soft wool of the sheep, the sharp quills of the poreupine, the tough armour of the armadillo, and the horn on the snout of the rhinoceros are all made of the same material, and are of the same construction as that of the human hair. "Widely different, however," says Professor Jones, "are the so-called horns of the deer tribe, which in reality consist of bone, and, being deciduous, have to be reproduced from year to year by a most peculiar and interesting process."

In their generative apparatus mammals in their lowest orders approximate to that of birds. The marsupials are ovo-viviparous, but in the highest orders these organs present a perfect type of structure; and lastly, as regards their nervous system, we find the fullest development of all its parts, necessarily commensurate with their high state of organization. The brain assumes its maximum development; the cerebrum and cerebellum, with additional lateral lobes, are greatly increased; and the various senses of smell, touch, sight, and hearing, according to the never-failing rule, have

all their corresponding motor powers in the nerves, in proportion to their increased use and energy of action; wherever, in fact, any organ, or set of organs, becomes more highly developed in any single species, not only in the vertebrate world, but in all classes of the animal kingdom, from sponges up to man, though it may be beyond the power of our microscopes to discover in the lowest acritous orders, there we may reckon with certainty that there is an increased proportionate development of the corresponding parts of the nervous system.

Uppingham, September 4th., 1857.

ON UNITY OF SYSTEM.

(Continued from page 225.)

THE intermediate period before mentioned, or the visible and natural creation is by, and the image of, the beginning, and to be for ever associated with the beginning hereafter, or rather then to be for Christ, who, when all things are subject to him, or when He has filled all things, will again, it is said, re-assume the state which was His before the creation. Thus all creatures have two states, one visible, the other as yet invisible; one to cease or be changed, the other eternal; the first as the means for the second; and the deviation from the way between the first and the second in man, may very generally be defined to be the using of the means as an end instead of for the end, and is, as we shall see, prefigured in the successive epochs of animals before the existence of man. We are told that the earth is to be restored, and to be possessed by man in his future new existence, and thence it might be inferred, were it not expressly so mentioned, that the intermediate part, or all creatures between the dust of the earth and man, will also be renewed, for all have one origin, and are of the same substance, and Christ partook also of the same, and thus the eternal life become the visible life, in order that the latter might finally cease in the former.

Every individual creature, like the whole visible creation, has its origin and support or body, and all its powers and faculties in Christ, and is thus in some degree His image, or the manifestation of His power and wisdom. With this persuasion we always have God, as it were, sensibly before our eyes, with the remembrance that he is equally present by His works in all times and places. He gives to every creature its peculiar structure, form, beauty, and economy, and its perfect adaptation to its habits, or the means to the end, and continually directs all its operations, and thereby we often see in the results of the instinct of minute creatures, much greater wisdom than man can devise. His own power will be almost hidden till

the end of the present creation, and will appear only in Nature, which is His image, and especially in man. Adam, and what is recorded of him, is said to be figurative of Christ, and thus the incident towards the end of the second chapter of Genesis, is said in the latter part of the Bible, to represent both the present state and the eternal life.

All creatures will retain their individuality in the future state, though they will be all filled in various degrees with the same eternal life; and in like manner it will be remembered, that all creatures on earth have one source of existence, that one power is common to them all, whether good or bad, high or low, and that this power is eternal life, which as such, is restrained or powerless during the present life, but is manifest by all creation.

The whole history of the earth and of man, from the beginning to the end of the Bible, is filled with comparative figures of the present and of the eternal state, or rather the earthly existence is continually limited, or diminished, or shortened, by the future life; and this is in exact accordance with the same law as prefigured in all natural objects, for the diminution of the inferior state in each of these objects, is accompanied by the partial transfer of its substance to the higher state. In other words the beginning and the end are in all instances figuratively or really brought nearer together, by the diminution or removal of the means, or of the intermediate part and state. In nature we find one law hidden in an endless variety of objects, and therefore continually varying in its expression. So in the Bible one law is concealed throughout, but the images under which it appears, are always differing from the beginning to the end.

The present or natural existence is figurative of the future or eternal one, and in Nature as a whole and in every one of its divisions or parts, and throughout the Bible the two states are typified by various figures, and the separation of the one from the other is everywhere inculcated, the two not being consistent, or co-existent, or to be combined. The eternal state is the beginning as well as the end; the present state is only intermediate, and the former is involved in the latter. Thus Nature, or the visible creation, is the means of the infinite increase of Christ, or of the eternal creation, and throughout nature every kind of creature, and innumerable combinations of creatures, and all of them collectively, are expressive both of Christ and of Nature; that is, of the whole visible creation, from beginning to end, and the eternal creation. As the present and the eternal creation cannot co-exist, the first must cease before the manifestation of the latter, and this can only be effected by Him in whom the present creation began, and whose power is concealed in every part of it. He, therefore, representing all creation, both natural and eternal, combined the former with Himself, in order that it might be destroyed, that is, changed

from time to eternity; and as it all began in Him, so it must first cease in Him, and thus by His death, He first removed in Himself the nature which suppresses the power of eternal life, and will afterwards do the same in all kinds of creatures, all being made by Him and for Him.

The Psalms, and some other parts of the Bible, express intense admiration for the works of creation, though so little of them were then known, and the present rapid increase of the knowledge of these works, claims a much higher degree of admiration, especially when it is considered that all parts of Nature are manifestations of the power of Christ, and that descriptions of all His works would be too numerous for the world to contain, and that all the treasures of wisdom and knowledge are hidden in Him.

(To be continued.)

WATER INSECTS, ETC.

BY O. S. ROUND, ESQ.

WHEN the sun begins to shine into our chamber really early, and nature is awaking from her winter slumber, I know of no more interesting study than can be found in a field pond filled with such a multitude of creatures, which are called forth from the *larva* or inactive state, in which they have passed the dreary dark months. I remember when I was a boy, a little nook of water of this kind forming one of the greatest sources of enjoyment I think I ever recollect, and the happy calm moments passed on its margin, bring back to my mind's eye bright gleams of warm and sunny young summer hours—how free from the whirl in which after years and business habits have since involved me! and I turn to them with an interest which few past hours still possess. I scarcely remember the time when the study of natural objects did not engross my chief attention, and I used to look into the depths of the calm clear stream, with something even then of sublime contemplation of those beautiful little beings which I saw sporting on its surface, or scudding and diving in its pellucid depths, and longed to dive too into those depths, and become familiar with those haunts that looked so cool and shady, and above all so clear and peaceful.

At last I bethought me of a contrivance which might in some sort effect my object, and this was no other than (gentle reader do not smile) an old skimmer, which, handleless and thrown aside, nevertheless was the thing I wanted. To this I fixed a long wooden handle, and for years after this instrument and a broad red earthenware pan, formed my aquatic entomological assistants. With the first I pursued the large Water Beetle, (*Dytiscus marginalis*,) that powerful and bold insect, into the depths of

the green weed in which he sought refuge; in vain did the Water Flea leave his eccentric gambols and sink beneath the surface, both were certain to be sucked into the vast jaws of the skimmer, which drawn forth, was speedily emptied of its water through its serrated side, and the unhappy victim left high and dry behind; not that I ever had a thought of harming him, for I immediately transferred him to my pan of clear water, and there had ample leisure to admire his bronzed or silver wings, and the beauty and ease of his motions.

As to the Water Newts or Efts, (*Triton palustris*,) they were an easy prey, and I rather sought to catch those who were more active and shy. I know it was for many years doubted whether this little animal was a distinct species from that found on sandy banks and on commons, but Mr. Ellis, that indefatigable naturalist, was supposed to have satisfactorily cleared up the matter, and I own that upon a careful series of observations, I was satisfied that he was correct in thinking that the two supposed kinds were identical; the chief reason for the mistake arising from the fact of their remaining two years in the transition state, before they become perfect land animals. But I met lately with a most talented gentleman who threw some doubt upon the matter, and I should be glad to draw the attention of the correspondents of "The Naturalist" to it, and to a no less important fact with respect to the same animal; namely, that it is not only a venomous creature, but that three distinct instances had come actually to his knowledge, in which its bite had proved fatal. Now I consider that these things are worthy attention, more especially in these days when we are apt to fancy that there is nothing more to be learned; and if it is not beneath their notice, I might likewise recommend my, perhaps, rather inartificial mode of examining specimens without taking the poor little creatures' lives, until at least they shall be proved to be venomous, for that I shall make the subject of special investigation, and perhaps give them to the world on a future occasion, through the medium of these pages.

Lincoln's Inn Fields, February 3rd., 1857.

CLAUSILIA ROLPHII.

TO THE EDITOR OF "THE NATURALIST."

IN the number of "The Naturalist" for the present month, (September,) I see that W. V. Guise, Esq., in a paper on the "Cotteswolds," throws considerable doubt on the accuracy of my statement regarding *Clausilia Rolphii*, contained in a "List of the Land and Fresh-water Shells found in the neighbourhood of Cheltenham," which appeared in your periodical

for August, 1854. I beg to assure you, nevertheless, that the statement referred to is perfectly accurate, and that within a fortnight of Mr. Guise's visit to Birdlip in April, 1857, I also revisited that place, after an absence of more than three years, and remained till the end of May, and during that period never experienced any difficulty in procuring at least "twenty specimens" of *Clausilia Rolphii* in an hour's search, exactly in the spot indicated; besides numerous specimens of all the shells mentioned by him, as found during his day's ramble, including also *Azeca tridens*, which was equally numerous with *C. Rolphii*.

As I had previously heard from the gentleman alluded to, as connected with the British Museum, that his search had been unsuccessful, I forwarded for his acceptance a box containing about a dozen *living* specimens, taken fresh the morning on which they were sent; but as I never received any acknowledgment, I presume the package must have miscarried.

I have the pleasure of enclosing for your acceptance, several specimens of the identical shells taken by me in May last, if they will be of the slightest service to you, and I shall also be most happy to forward a series to Mr. Guise, if he will favour me with his address in full.

C. Rolphii appears to me to be gregarious, and is certainly *very local*, but I cannot conceive how either of the gentlemen failed to find it, as the marks made by Mr. Guise's search amongst the *Chrysosplenium* were perfectly visible, precisely in the spot where I took so many only a few days later. I also met with the same shells in equal numbers near the park wall in the same wood, but there also confined to a small space; indeed with my little children's assistance, I procured upwards of sixty specimens there, in a very short period. Later in the same year, (1854,) I found *C. Rolphii* about a mile from Southborough, near Tunbridge Wells, and also near Petersfield, in Hampshire, in company with *Helix obvoluta*.

Bulimus lachamensis, abounds in the Birdlip Woods during spring, though it is difficult to procure later in the season: I met with one specimen with reversed volutions. The white variety of *Clausilia bidens* is also by no means unfrequent.

It may interest some of your readers to know, that during July last I had the pleasure of taking, near Bowness, Windermere, several specimens of *Vertigo alpestris*, evidently quite a distinct shell from *V. pygmaea*, also *V. sexdentata* and *Helix lamellata*; the latter I also procured at Castlehead, Keswick; and in the woods of Bonshaw and Springkell, Dumfriesshire.

Before leaving Birdlip I pointed out the exact spot to Mr. Pinching, the landlord of the Black Horse, that he might be able to indicate it to any visitor interested in the subject, so that should Mr. Guise or his friend again visit Birdlip, I feel assured that they will be rewarded by success, indeed I had a letter from a gentleman about a month since, to

whom Mr. Pinching had acted as guide, stating that in a very short time he found a *sufficiency* of specimens.

W. WEBSTER.

Upton Hall, near Birkenhead, September 14th., 1857.

NOTES ON THE NATURAL HISTORY OF EAST CUMBERLAND.

BY MR. THOMAS ARMSTRONG.

(Continued from page 226.)

Trollius Europæus, (Globe flower,) and *Aquilegia vulgaris*, (Columbine,) grow side by side upon those beautiful banks in the vicinity of Armthwaite, that decorate the Eden on both sides, a locality fertile in botanical productions, and full of wild and majestic scenery, and to those who may happen to visit Baron Wood, in order to see it fully, it is well to know that it is from the Coombes side of the river that the grandeur of the scenery presents itself.

Parnassia palustris, (Grass of Parnassus,) is plentiful on the boggy pastures around Froddel Crook, which is in full bloom in September; *Agrimonia Eupatoria*, (Agrimony,) *Saponaria officinalis*, (Soapwort,) and *Inula dysenterica*, (Fleabane,) are to be found in the Coombes Wood; so also grow *Senecio sarracenicus*, (Broad-leaved Ragwort,) and *Allium ursinum*, (Garlic,) along the Eden, which flows between here and Baron Wood; *Malva rotundifolia*, (Dwarf Mallow,) and *Leonurus cardiaca*, (Motherwort,) are found in the same locality.

At the foot of Blaes Fell, and on the Cowran hills, I have gathered *Echium vulgare*, (Viper's Bugloss,) and *Polemonium cæruleum*, (Greek Valerian)—the latter is a plant, as well as *Hyosciamus niger*, (Henbane,) that are seldom met with in Cumberland.

On the Solway Flow grow *Drosera longifolia*, (Sundew,) *Narthecium ossifragum*, (Asphodel,) and *Andromeda polifolia*, (Wild Rosemary.) *Solidago virgaurea*, (Golden-rod,) *Campanula rotundifolia*, (Bell-flower,) *Hieracium pulmonarium*, (Hawkweed,) adorn our cliffs. *Orchis maculata*, *Primula farinosa*, (Bird's-eye Primrose,) *Lychnis flos-cuculi*, (Ragged Robin,) *Agrostemma Githago*, (Corn-cockle,) and *Chrysosplenium oppositifolium*, (Saxifrage,) bedeck the valleys.

In 1854, on the 8th. of March, a specimen of the Great Bustard, (*Otis tarda*), was shot at Lees Hill, near Brampton.

On Scratchmans Scaur, near Penrith, the Honey Buzzard, (*Pernis apivorus*), was shot in 1855, having shortly before robbed a wasp's nest, as its stomach was full of the larvæ of that insect.

The Green Cormorant, (*Pelecanus cristatus*), was shot on the Calder, near Cummersdale, on the 2nd. of October, last year.

The Spotted Rail, (*Crex porzana*), has frequently been shot on Monkhill Lough. I met with a specimen last year that was shot on August 24th. The Quail, (*Perdix coturnix*), is common here; a fine male specimen was shot on the 24th. of December, 1856, at Blackwell.

The Tufted Duck, (*Anas fuligula*), the Pintail, (*Anas acuta*), the Garganey, (*Anas querquedula*), the Scoter, (*Anas nigra*), the Shieldrake, (*Tadorna vulpanser*), and the Shoveler, (*Anas clypeata*), are frequently met with.

The Surf Scoter, (*Anas perspicillata*), one of our scarcer British birds, was killed at Crofton Hall, by a farm servant, on the 2nd. of November, 1856; and fell into the hands of the late naturalist, Thomas C. Heysham, Esq., of Carlisle. It was first noticed diving on one of those beautiful ponds where the fallow deer are sometimes observed to plunge, near the mansion of their owner, Sir Wastel Briseo, Bart.

The Kite, (*Milvus regalis*), was shot near Carlisle, on the 13th. of November, 1856. The Merlin, (*Falco Æsalon*), is common on Alston Moor; they are frequently shot where Red Grouse, (*Lagopus Scoticus*), are abundant, and which this little bird does not hesitate to attack and destroy.

In the lake district, on Ullswater, many rare birds of the order *Anseres* are often met with, which are to be seen in the collections of the taxidermists of Penrith.

The Little Auk, (*Alca alle*), was caught at Rockliff, in a fisherman's net, on the 13th. of November, 1856. A fine specimen of the Red-throated Diver, (*Colymbus septentrionalis*), was caught in a similar way in April, the same year.

I have also paid particular attention to the Oology of the district. In 1855 I found the nest of the Sandwich Tern, (*Sterna cantiaea*), with two eggs, on Burgh Marsh; and in the same year, near the Solway, I found that of the Black Tern, (*Sterna nigra*); the only instances of these birds breeding here.

The Tawny Owl, (*Ulula stridula*), the Barn Owl, (*Strix flammea*), the Long-eared Owl, (*Strix otus*), are common here. I have taken the eggs of the latter from the same nest three successive seasons.

The eggs of the Cuckoo, (*Cuculus canorus*), and the Nightjar, (*Caprimulgus Europæus*), as well as the Pied Flycatcher, (*Muscicapa luctuosa*), are often taken here. On Wragmire Moss I once found the egg of the Cuckoo in a Titlark's nest, and observed a Cuckoo perched on a low tree, a pair of Titlarks were flying around it, one at last settled upon its back, the Cuckoo all the while flapping with its wings; the other was flying about them with apparent fondness, the Cuckoo evidently delighted with

their caresses. On Sealeby Moss I once found two eggs of the Cuckoo in a Titlark's nest. Another Cuckoo laid an egg last year in a Robin's nest, in a garden at Great Orton, which was duly hatched. The nest and young bird were put in a cage near to the place; a wire of the cage was broken to admit the foster-parent which reared the young Cuckoo; the latter lived sometime afterwards inside of the house, and at last effected its escape.

In a cleft of a rock I once found, on the 20th. of May, the nest of the White Owl, (*Strix flammea*.) with four eggs, surrounded on all sides with the young of the Jackdaw, with which it is on friendly terms. One evening a severe battle took place in a Rook's nest which was a little detached from the rookery; a close eye was kept upon them, and one of the combatants flew off and was observed to drop something; upon inspection it was found to be an unfledged Rook, which was attempted to be carried off by the Tawny Owl.

The Crossbill, so numerous last year in this district, remained past the usual time, and judging from the lateness of the season, that some of them would remain and breed, I searched for their nests, but did not succeed until I met a young man in the country near Cumwhinton, who stated he had seen a pair build. I visited the spot, which was a small fir plantation near Cumwhinton, and found the nest placed on an outside fir containing four eggs; they resemble those of the Green Linnet, but are larger and of a darker shade. The nest was placed eight feet from the ground, fixed between a branch and the butt of the tree; the outside was composed of fir twigs, the inside with dried twitch-grass, and one large feather. This was on the 20th. of March; the Crossbills remained with us until May, when they gradually disappeared altogether.

In conclusion I wish to advert to the Entomology of the district, which may be considered the most beautiful and most varied of the works of nature. Cumberland is a wide field for insect operations, and produces many scarce and good moths.

The Death's Head, (*Acherontia atropos*.) is frequently met with. One was taken at rest upon a stone at Hayton, on the 23rd. of September last year; another was taken from a lamp in Finkle Street, Carlisle; and several others have also been taken in former seasons in this locality.

We take here *Noctua leucographa* and *Taeniocampa populeti*, the former plentifully some seasons; *Xylocampa lithoriza* is taken from old railings, at rest during the day, in April. The best mode to get good specimens of *Notodonta dictœa*, *N. dictœoides*, *N. zic-zac*, *N. carmelita*, and *N. dromedarius*, is to beat the birch and sallow in September for the caterpillar. *N. carmelita* is taken in June from the birch, which is much earlier.

The Duke of Burgundy, (*Nemeobius lucina*.) flies on the 15th. of May,

in Baron Wood. The Little Blue, (*Polyommatus albus*), on the 5th. of June, as well as *Strenia clathraria*, on the Cowran Hills. *Dianthecæ conspersa* flies on the 15th. of June, around the flowers of *Lychnis flos-cuculi*, taken in the evening with the net. *Xylophasia scolopacina*, *Eupheria fulvago*, as well as *Noctua depuncta*, can be taken at sugar; the first two can be beaten out of the oak by day, and much better specimens obtained.

A good rag-wort field should never be overlooked in August, as many insects are taken with the lamp in the evening from the rag-wort; *Spælotis pyrophila* is taken in this way along our Cumberland coasts.

Melanippe hastaria is taken flying at the heat of noon; *Oleora Glabraria* must be beaten from the oak, about the 24th. of July. *Lithosia mesomella*, *Procris globularia*, *Platypteryx falcula*, *Acidalia lutearia*, *Coremia pectinaria*, are taken about the latter end of June on Orton moss.

The lamps about the outskirts of towns should be examined in April, as well as most carefully at the latter end of the year; it is in this way that you will obtain *Cerura vinula* in April, and *Petasia cassinea*, (Sprawler,) and *Pæcilocampa populi* in October.

Many good moths are obtained by digging for the pupæ; in this way we take here *Biston prodromaria*, *Taniocampa populeti*, *Segetia xanthographa*, etc.

A Locust was caught last month on the Sheep Mount; another was taken behind a house in Spencer Street, Carlisle.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portion of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

THE following list of Lepidoptera, observed by me in the county of Suffolk, during my residence there of two years, is drawn up, with a two-fold object in view, first, in the hope that others may be induced to compile similar records of the insects observed in their respective counties; and secondly, under the impression that the occasional remarks as to the habits, localities, etc., of some of the species, might prove serviceable to those of your readers who may be only entering upon the Entomological campaign. My own field of observation was somewhat limited, being confined to Brandeston and Playford, two small villages, respectively distant from Ipswich twelve and five miles. Under these circumstances I should not have presumed to call this list "A List of the Lepidoptera occurring in the county

of Suffolk," were it not for the kind assistance rendered by two well-known brother entomologists, the Rev. H. H. Crewe, and C. R. Bree, Esq., residing in the same county. Owing to his long residence at Stowmarket, his *accurate* and *trustworthy* observation, and his unwearied zeal, no person could be found better qualified to impart information than Mr. Bree, and to him accordingly it will be found that I am largely indebted.

J. GREENE.

32, Lower Pembroke Street, Dublin.

PART I.—RHOPALOCERA.

1. *P. Machaon*.—Taken in the Rectory Garden at Erwarton, near Ipswich, a few years since, and now in the collection of Miss Mary Berners. There are some salt-marshes about half a mile from the Rectory, where the insect would not be at all unlikely to occur. The Wild Fennel, (*Feniculum officinale*, Bab.) which is one of the food-plants of the larva of *P. Machaon*, grows in the marshes. (C.)

2. *G. rhamni*.—Not uncommon.

N.B.—I am almost positive that *Rhamnus catharticus* and *frangula*, Linn. are not the only food-plants of the larva of this insect, as both these shrubs are exceedingly uncommon in the neighbourhood of Stowmarket, where the perfect insect is abundant. *R. frangula* I have not yet seen at all, and *R. catharticus* occurs most sparingly in solitary bushes. The larva may be found of all sizes the last week in June and the beginning of July. I have taken it abundantly in Kent on *R. frangula*, but never saw it upon *R. catharticus*. It is not very difficult to see if you examine the leaves of the former shrub tolerably close. It may also be beaten into an umbrella. It feeds upon the upper side of the leaf. In appearance it closely resembles the larva of *Pieris rapæ* and *napi*, though it is of course much larger. It is extremely easy to rear. The pupa is a most beautiful pale green, without any spots. It is suspended in the same manner as the pupa of *P. brassicæ*, *rapæ*, and *napi*. (C.)

3. *Colias edusa*.—Taken once in my own garden, and by Professor Henslow at Felixstowe. (B.)

Has been noticed at Battisford and Old Newton, near Stowmarket, by Mr. William Baker and Mr. R. Bull. (C.)

4. *C. hyale*.—Taken by Prof. Henslow at Felixstowe. (B.)

A pair were taken, and several more seen, a few years since by Mr. R. Bull, at Old Newton. (C.)

5. *Papilio brassicæ*.—Abundant.

6. *P. rapæ*.—Abundant.

7. *P. napi*.—Abundant.

8. *A. Cardamines*.—Common. The ♀ however is here, as elsewhere, according to my observation, much rarer than the ♂. This year, (1857,) I noticed a specimen on the wing as early as the 3rd. of March.

N.B.—The larva is not uncommon in July on the seed-pods of the Common Rocket, or Dame's Violet, (*Hesperis matronalis*, Linn.) a plant common in most flower-gardens, though rare in the wild state. It also feeds upon the seeds of the Bitter Ladies Smock, (*Cardamine amara*.) The pupa is pale brown, and is most singularly sharp-pointed at the head. (C.)

9. *L. sinapis*.—Very local. Only met with in a wood near Stow-market. It is very easy to capture. Its favourite haunts are sunny glades and walks in the woods. Its flight is slow and heavy, but it presses onwards with a pertinacity truly remarkable; nothing apparently will make it turn back. If you miss it, which is not likely, it calmly ascends about two yards over your head, and then re-commences the even tenor of its way, till having arrived at the end of the walk, it mounts over the under-wood, vanishes, and in about ten minutes re-appears, pursuing its monotonous course, and enjoying life after its own fashion, till both are summarily terminated by the ruthless net of the heartless entomologist.

N.B.—It is worthy of notice that when dead it will often stiffen in half an hour. (C.)

10. *S. ægeria*.—Very abundant.

11. *S. megæra*.—Very abundant.

N.B.—The larva, which is green and slightly hairy, feeds upon the young blades of various species of grass in March. I took one about half-fed this year, 1857, on March 2nd. It may be found in the day-time by pulling up the tufts of grass on banks, and round the trunks of trees. I have found it when pupa-digging. It feeds at night, and conceals itself in the day. The pupa, which is most delicate and beautiful, is a pale sea-green, minutely studded with gold spots. It is suspended by the tail. This insect is double-brooded. I saw one to-day, Oct. 12th. I have not taken the larva of the second brood. (C.)

12. *S. semele*.—Not uncommon, but very wary, and difficult to capture.

13. *S. Janira*.—Very common.

N.B.—The larva of this insect, which is a bright apple-green, and hairy, feeds upon various grasses in May. I have taken it both by sweeping and examining by lantern light the grass at the edge of ridings in woods, and on banks. It feeds by night. The pupa is green, marked with black. (C.)

14. *S. tithonus*.—Very common. (B.)

15. *S. hyperanthus*.—Very common.

N.B.—The larva may be found abundantly where the insect occurs by examining with a lantern the grass at the edge of ridings in woods. It

occurs in May and June. It is a pale reddish brown, and hairy. It feeds indiscriminately upon various grasses, and crawls up to the top of the blade as soon as it is dark. It effectually conceals itself during the day. The pupa, which is pale brown, is enclosed in a slight web among the roots of the grass. It is not easy to breed. Out of some fifty pupæ I reared only four or five perfect insects, two years since. I think it arose from my having kept the pupæ too dry, and not allowing them any sun. (C.)

16. *S. pamphilus*.—Very common.

17. *Limenitis sibilla*.—Common in woods near Ipswich and Stowmarket. (B.)

18. *Apatura iris*.—Common in oak woods in various parts of the county. (B.)

19. *Cynthia cardui*.—Not common. Taken in my garden, September 6th., 1857. (B.)

Mr. Stainton, in the Manual, does not mention the Common Nettle, (*Urtica dioica*, Linn.,) as one of the food-plants of *C. cardui*, but I have taken it quite as frequently upon that plant as upon *Cnicus arvensis*, Hoffm., which, by the bye, is also omitted by Mr. Stainton in his list of food-plants. The larva unites the edges of the leaf together by a web in which it lives, only coming out to feed. (C.)

20. *V. atalanta*.—Common.

21. *V. Io*.—Common.

22. *V. antiopa*.—Taken during the last ten years in various parts of the county, namely, Stowmarket, Needham Market, Hitcham, Elmswell, and Erbarton. (B.)

23. *V. urticae*.—Common.

24. *V. polychlorus*.—Common, both in the spring and the close of summer. Larva in profusion on elms.

25. *A. paphia*.—Common.

26. *A. adippe*.—Common. (B.)

27. *A. Lathonia*.—Seven taken in a clover field near Ipswich, by Mr. Garrod, of that town. Mr. G., who is a most respectable person, and a tradesman of high character in the town, showed Mr. Crewe and myself the only pair he had left; he described minutely the time and place where he captured them, and stated to whom his duplicates had been given. (B.) (C.)

28. *M. selene*.—Common.

29. *M. Euphrosyne*.—Common.

30. *M. Athalia*.—Mr. King, the dealer, once showed me a series of this insect, which he stated he had taken near Ipswich. I never met with it. (B.)

31. *M. artemis*.—Taken by Mr. Arthur Simpson, close to my grounds at Stowmarket, in May, 1857. (B.)

32. *A. lucina*.—In various woods; not very common. (B.)

33. *Thecla Betulæ*.—Taken by Miss Berners, in woods near Ipswich. (B.)

34. *T. pruni*.—I once captured a wasted ♀ of this rare species at Brandeston. It was hovering over some black-thorn, doubtless with the intention of laying its eggs. I fully expected to meet with it the following summer, but unfortunately I had to change my residence before the period of its appearance in the perfect state, and though I carefully searched for it at Playford, where its food abounded, I was not fortunate enough to see it again.

35. *T. W-album*.—In great profusion in the larva state. The description of the larva given in the "Manual" is correct, with the exception of calling it light green; it is rather a pale primrose. When the seeds of the wych elm are nearly ripe, it is fully grown. Take an open umbrella, and place it on the ground; then grasp a branch, thrash it *well* over the umbrella, and, if the insect occur in the same plenty as at Playford, you will rarely fail to find from three to as many as ten larvæ. I became quite tired of taking them. They are extremely voracious. The larva, when free, turns to a pupa on the under side of the leaves; and a quick eye may detect them by dozens. I need scarcely remark that, in common with the rest of this genus, it is very difficult to capture in good condition when on the wing, and, even when bred, the slightest touch is sufficient to injure irreparably its rich black satiny gloss. It soon fades. I may add that it does not seem much exposed to the attacks of Ichneumons, as out of upwards of one hundred larvæ I did not find one stung.

N.B.—The larva of this insect entirely changes colour a day or two before spinning up. It loses its beautiful primrose colour, and becomes reddish brown. Out of between sixty and seventy larvæ and pupæ which I took this summer, about twenty were infested by a white fleshy maggot, which produced a species of *Diptera*. (C.)

36. *T. quercus*.—Also common, and apparently distributed over the whole county. I bred very large and brilliant specimens from larvæ beaten off oaks at the end of June.

N.B.—The larva of this species, when ready to assume the pupa state, descends the trunk of the tree, and spins a slight web among the roots of the grass. (C.)

37. *T. rubi*.—Very abundant. Whether this insect be double-brooded, in the strict sense of the term, I am unable to say, but I am disposed to think it is. The autumn brood, however, if it be one, seems to be much smaller than that of the summer. From the above it will be seen that the whole of the genus *Thecla*, excepting *Betulæ*, has fallen under my own notice in Suffolk.

38. *C. phlœas*.—Common.

N.B.—I have in my collection a straw-coloured variety of this species taken near Ipswich. (B.)

A straw-coloured variety of this species was taken this summer (1857) at Erwardon, near Ipswich, by Mr. A. Berners. (C.)

39. *P. argiolus*.—Taken by Mr. Levett, in Finborough Park, but not the last year or two. (B.)

40. *P. Corydon*.—Taken by me on Creting Hills, August 14, 1856. (B)

41. *P. alexis*.—Common.

Mr. Bree and myself took the larvæ of this insect plentifully in July, 1857, on the Thorny Rest-harrow, (*Ononis campestris*, Bab.,) when sweeping for the larvæ of *Heliothis marginata*. It is dark green and onisciform. The pupa is a very pale brown. In colour and slighness of texture it very much resembles that of *M. stellatarum*. It is enclosed in a slight web amongst the roots of the grass. (C.)

42. *P. agestis*.—Scarce and local. It is stated in the "Manual" to "occur only in the South;" but this is an error.

43. *S. alveolus*.—Common, but local.

44. *P. linea*.—Common. (B.)

45. *T. Tages*.—Common, but local.

46. *P. sylvanus*.—Abundant.

Arge Galathea is reported to have been taken on the chalk hills about Coddendam a few years ago. Any insects omitted in the list, if supported by competent authority, will be inserted in an appendix at the end of the series of papers.—Ed.

In the above list of the British Butterflies observed in Suffolk there will be noticed one or two discrepancies when compared with insects said to have occurred near Stowmarket in "Stainton's Manual," which information was supplied by the editor. When that information was asked for we did not know that it was intended to be inserted in a standard work, and consequently one or two mistakes have occurred either from inadvertence, or in consequence of relying too much upon doubtful authorities. We look upon the "Manual" as a most valuable work, and one which reflects the highest credit upon its zealous and indefatigable author. It is the first really sound work on Entomology which is placed by its extraordinary cheapness within the reach of everybody. As such it is the duty of all sincere Entomologists to make it as perfect as possible, and in this spirit we shall feel obliged if those who possess the work will pass their pen through the "St." at the end of the following insects:—*A. aglaia*, *M. cinxia*, and *S. paniscus*, (they may occur in the county, but we have no certain information;) and add an "St." to the following:—*L. sibilla*, *T. betulæ*, *T. W-album*, *P. corydon*, and *P. agestis*.—Ed.

(To be continued.)

Ichneumon and Tortrix Larva.—Whilst sitting under a large chesnut tree in my garden on the 20th. of September, I saw a *Tortrix* larva suspended by its silken thread from a branch of the tree. Presently one of the very small Ichneumons so abundant at this season came down the thread about a foot, and then stopped, as though it intended to make observations. Of course its object was to get at the small larva, then about a foot and a half from the ground. Whether its instinct told it that the larva might, in case it descended, be at that distance from the tree too heavy for the silk to bear its own weight in addition, or what were its contemplations, I know not, but having remained a few seconds stationary, it ran back to the branch of the tree. In about half a minute however, during which time little *Tortrix* grub had been making its way earthward, it returned again to the same spot. To my equal surprise and astonishment the Ichneumon now begun slowly to draw up the larva, just as a human being would draw a bucket from a well. Its wings and legs were in violent motion, and I observed a small knob or ball at the point of the thread where it was situated. *Nolens volens* up came the grub, and when it arrived an unwilling visitor at the knob or ball above mentioned, the Ichneumon walked on to its back and commenced the process of oviposition! Anxious to immortalize the name of the principal performer in this curious feat, I boxed both insect and larva, but having incautiously lifted the lid a very little to see how my friends were inside, out flew the Ichneumon, and as I made a dash with the box to re-capture it, the larva fell into the grass, so I thus clumsily lost them both. This incident displays an amount of so-called instinct for which I should not *a priori* have given the insect credit.—C. R. BREE, October 10th., 1857.

The Wasp and the Spider.—In the above case of the Ichneumon we have seen an exercise of instinct approaching very closely to reason. In the following instance instinct seemed to have failed for once, but the Wasp made up for the deficiency by a process very like that of reasoning. Walking through my shrubbery yesterday, I saw a Wasp entangled slightly in a Spider's web. The Spider, as usual, rushed down upon its supposed victim. A sharp struggle ensued, which ended, however, in the victory of the Wasp, who, clutching the Spider, stung him repeatedly, and then deliberately cut off the said Spider's eight legs, and flew away with the body.—Idem.

Exchange.

Marine Shells.—I should be glad to exchange *Terebratula caput-serpentis*, *Lima hians*, from Oban, for shells from the southern coasts, etc.—C. F. TOOTAL, Chesnut Street, Wakefield.

Review.

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This number contains Reviews of:—

Review 1.—“Popular Geography of Plants.” By G. M. C. Edited by Charles Danbury. 2.—“Popular History of British Lichens.” By W. Lander Lindsey. 3.—“Insecta Britannica—Diptera.” By Francis Walker. 4.—“Manual of British Butterflies and Moths.” By H. T. Stainton. 5.—“Ferns of Great Britain.” By J. E. Sowerby. 6.—“The Fern Allies.” A supplement to the preceding. 7.—“British Poisonous Plants.” By Charles Johnson.

Also notices of eighteen original communications made to various societies.

The Retrospect.

The Penguin.—In a review of a book of Travels in Patagonia and the Falklands, in the “Athenæum” for October 3rd., mention is made of the capture of a Penguin, “the skin of which one man could barely carry!” Now the Penguin, according to Baron Cuvier, is only the size of a Goose. I submit that the Albatross is the bird meant, though not expressed, for this bird breeds in company with the Penguin, and being the size of a sheep, more accords with the relation quoted in the above review, and which has escaped the reviewer’s notice.—D. PAYNE, Nottingham, October 14th., 1857.

The Querist.

Autumnal tones.—One often remarks, and often hears remarked about the autumnal tints; and I have often remarked, but do not remember ever to have heard remarks on the autumnal tones. Do not my country readers agree with me that the sound of the cawing of the rooks in September and October, has quite a different sound from the note of the same birds in the winter or spring months? Whether it be the fineness of the air, at this the finest season of the year, that causes the effect, or whether the voice of the bird is itself different, certain it is, that to me at least the effect is that I have spoken of, and the sound most musical.—F. O. MORRIS, Nunburnholme Rectory, October 1st., 1857.

Can any of my, or to speak more correctly now, of our, entomological readers tell me the best method of taking grease out of a drawer, from grease in an insect in it, without having to paper or whiten the whole drawer afresh?—F. O. MORRIS, Nunburnholme Rectory, October 1st., 1857.



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BY C. R. BREE, ESQ.

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the earth is full of Thy riches.—PSALM civ., 24.

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Communications have been received by the Rev. F. O. MORRIS from Messrs. M. G. GIBSON;—W. G. JOHNSTONE;—W. F. ROOKE, M.D.;—H. PAYNE, M.D.;—O. S. ROUND;—F. WALKER;—F. M. BURTON;—J. G. BAKER;—T. GALLIERS, (two);—R. WEAVER.

Communications, Drawings, Advertisements, etc., to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York;—Books for Review and Parcels, to the care of Messrs. GROOMBRIDGE, 5, Paternoster Row, London.

ENTOMOLOGY.

Communications have been received from J. LEEDS FOX, Esq.;—W. GARNES, JUN., Esq.;—The REV. J. GREENE;—The REV. H. H. CREWE.

We shall publish next month a list of the rarer Coleoptera found in Suffolk.

* * All communications on Entomology intended for insertion in this department of "The Naturalist," must be sent before the 15th. of the month to C. R. BREE, Esq., *Stowmarket, Suffolk.*

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THE NUTHATCH.

BY O. S. ROUND, ESQ.



THIS is the *Sitta Europea* of Linnæus, and forms a kind of link between the Woodpeckers and the Titmice, of the characters of both of which it partakes. Like both, it builds in hollows of trees; like both, it feeds on insects, although these do not constitute its whole food; like both, it stays with us the whole year, and is an active and bold bird. Although at first sight it has not the appearance of the Woodpecker, yet view it in the hand, and when in an erect position the resemblance cannot be denied. It is by far the best creeper of the whole prehensile genus, as it seems to make no earthly difference whether it crawls on the trunk of a tree up, or down, or sideways; it also perches like any of the Insectivoræ, and has a square short tail, for, from its very thickness and muscular conformation, it needs no *fulcrum* to assist its motions when running over the bodies of trees, being perfectly capable of supporting itself in any position by means of its great bodily power and strength of leg. In size the Nuthatch much resembles the Wryneck, with which, indeed, it forms a separate class. All its upper plumage is of a blue-grey colour, and its under parts light cream; a black line over the eye; the bill being very strong and black, the under mandible light at the base; the legs formed for the greatest power, having an exceedingly wide span, and being light-coloured, with very strong claws: the feathers under the wings are chocolate-coloured.

It is quite surprising to see what strength and perseverance is exhibited by this little creature. A great part of his food is nuts, and the shells of them he perforates by sheer hard labour; after he has picked the nut he carries it to some convenient chink in a gate-post, wall, or more commonly a cleft in the bark of a tree, and fixing it firmly there, he takes a position as advantageously as he can directly above it, and springing at it in the most determined manner, with wings fluttering at every stroke; you may see, and hear him too, hammering away until he makes a jagged hole, through which he extracts the kernel; and in fine weather he is at this work from morning till night, so he need be firmly made, muscularly speaking. I have watched them for hours together, when visiting in the country, at a house round which were many acacias, the rugged bark of which was peculiarly adapted for their purpose.

Their nest they generally make in some hollow of a tree, or often in a hole of a wall, but, as they are very averse to intrusion, they reduce the original orifice by means of clay, which is firmly plastered around the entrance with their bills, and is full of small indentations from the point of

this natural trowel. The hole they usually leave for ingress and egress is so small, that it seems impossible that such a square-formed stout bird can pass through it, but this they manage somehow, certainly allowing themselves as little room as may be. Having paid this attention to their defensive outworks, the nest is as carelessly put together as you please, consisting of grass and feathers, much like a Bank Martin's; in this nest five eggs are usually found, which are like the Wryneck's, white.

This bird seems to court observation instead of avoiding it, as in the case of the Woodpeckers, as well by its loud sonorous voice, as its active habits, for it runs over and under the smallest twigs with the greatest ease, and is perpetually in motion except when it finds a nut to crack, and then, like some restless people that are found in the world, it is quiet enough till it has despatched that business, and then it is off again in search of fresh matter to discuss. I often think its life must be a very hard one; for observe the Titmouse, the Willow Wren, or any of that small flitting class; it is true they appear to be constantly in motion, but they are hanging motionless half their time at least, to some catkins or fir-apple, picking out the seeds or insects. Look again at the Woodpecker tribe, they indeed are constantly on the hunt for insect food, but then they merely cling to the bodies of trees, and their motions when they shift their position, are extremely laboured and awkward. As for the Wryneck, he sits almost motionless on the grey limb of some old tree, from which he is scarcely to be distinguished, his plumage bears so great a resemblance to it. No activity but that of the Swallow tribe can equal that of the Nuthatch. I do not think there is much difference between the cock and hen; if anything she is lighter than he in colour, and less in size.

THE CROSSBILL.

BY O. S. ROUND, ESQ.

THIS is a rare bird in England, and as it has very seldom bred with us, we know almost nothing of its nidification. I believe in the aggregate that great numbers visit us annually, but then they confine themselves to large pine shrubberies, which are only found in the heathy tracts of the country, and so the cultivated districts see nothing of them. Having resided, for several years among Scotch fir plantations, I have had good opportunities of observing them, and have shot a good many at different times; I have some preserved specimens by me while I write. They vary so much in plumage that I do not think I ever procured two exactly alike; however these must be only regarded as varieties of five distinct stages of feathers, which I look upon to be these, namely, old cock

birds, young cock birds, and the same of hens, but to which the fifth class belongs I have never been anatomist enough to discover; for, although they bear most resemblance to the hen, they are brighter in their colours.

The plumage of the old cock birds is mostly red, mixed with yellow and green, the head and rump brightest, whilst the wings, tail, and back, are deep brown, every feather edged with pale green. The hens have the wings, tail, and back, the same, but duller, and the rest dull yellow green; the legs are strong and black in both. The other varieties, which, I suppose, in the absence of direct evidence and reasoning from analogy, we must take to be young cock birds, partake of the plumage of both old birds in some measure, and have a good deal of red, yellow, and even black scattered over their feathers; but the distinguishing mark, which is the same in all, is the bill. This is very strong and hooked, and of a dark horn-colour; but, instead of the two mandibles lying upon each other, and resting as in all other birds, they cross near the end, the under one turning to the right, and the upper to the left.

The food of the Crossbill is the seed of the pine; this, as it is resident between the closely-adhering leaves of the cone, requires some more than ordinary means to dislodge it; this means, the curiously constructed bill of this bird supplies, for the two pointed ends of the mandibles being brought in opposition to each other, are inserted in this position between the leaves of the fir apple, and then, by means of the most powerful lateral muscles forced past each other, by which means the seed is sufficiently exposed to be seen by the eyes of the bird, and scooped out and extracted by the tongue, which has a formation peculiarly adapted for this purpose. The indefatigable Mr. Yarrell has investigated this, as well as many other intricate branches of natural history, and his discoveries, accompanied by explanatory figures, will be found in the fourth volume of the "Zoological Journal."

The native country of the Crossbill is Germany; and the pine forests of the Hartz Mountains are their chief retreat. Their manners are solitary and quiet, and not unlike those of the Parrot, indeed they have been named the German Parrot, as they use their bills as a third leg, and carry the pine-cones in one claw, standing on the other. They are powerful flyers, and we generally see them in flocks. Their only note is a loud chirp, modifications of which they sometimes utter when disturbed, but they are generally very quiet when engaged in feeding. Their figures are rather clumsy, and more muscular than elegant; their heads large, and their tails forked, the under or vent feathers being white, spotted with black.

I have seen specimens of young birds bred in England, but these were few and far between; and I only once had a nest brought me said to be

that of the Crossbill. It was made of roots and wool, loosely enough, and contained six largish eggs, white, with brown spots: but the authenticity of this I cannot vouch for, as village ornithologists cannot be depended upon.

There are some seasons in which the Crossbill is very scarce with us; this is chiefly when the weather is very dry and hot, and this may be easily accounted for, as being natives of a cold climate, transition would be probably detrimental to the health of the bird, for it has so seldom happened that they have bred in England, that their visits are probably a sort of uncertain or even capricious migration, depending very much upon circumstances. One thing I have constantly remarked, namely, that the scarcity of fir-cones is accompanied by an almost total absence of these birds, but whether they exercise in this a kind of instinctive prescience, or having arrived, immediately retire again to their native shores for lack of subsistence, must remain, like many other facts, unknown. Their transit, however, to and fro, must be easy, for scarce any bird possesses greater power of flight, or is more fitted, from its hardy nature, for distant migrations.

ON UNITY OF SYSTEM.

(Continued from page 247.)

IN pursuing this subject it seems better to incur the charge of repetition or of diffusiveness, than that of obscurity, and therefore the present notes are introduced, commencing with the beginning of creation, a previous state or eternity being apparently beyond the comprehension of man. Creation defines the outlines of man's understanding and knowledge, and marks out space and time, and time seems to be dependent on space.

The spheres, such as stars or suns, planets, comets, and ærolites, indicate the principal divisions of time by their movements in space. The solid globe of the sun occupies a space of nine hundred thousand miles in diameter. Around this a circle of somewhat less than three hundred millions of miles in diameter, includes Mars, Venus, Mercury, and the Earth, with the Moon, besides numerous comets and innumerable ærolites. The next concentric circle to be noticed has a diameter of nearly eight hundred millions of miles, and the space between it and the first circle is occupied by thirty-four or more planets.

The third concentric circle is rather less than six thousand millions of miles in diameter, and in the space between it and the second circle there are four planets—Jupiter, Saturn, Uranus, and Neptune; this last one having an annual circuit which is as long as one hundred and sixty-four of the Earth's years. The last concentric circle of the solar system

has a diameter of more than one hundred and forty thousand millions of miles, and is included in the orbit of a comet. The revolution round the sun of one comet exceeds in length five hundred years; and another comet is supposed to occupy a far longer period of time in its orbit. The solar system just noticed is but one star among the many millions of stars in one astral system. Light in one minute travels more than ten millions of miles, and thus it is eight minutes in passing from the Sun to the Earth, four hours in passing from the Sun to Neptune, and ninety-six hours in passing from the Sun to one of the comets. But the distance of the nearest star is about eighteen million million miles, and therefore light takes three years in coming from it to the Earth. Again, light occupies four thousand years in its passage to the Earth from a star of the twelfth magnitude, the latter being at a distance of twenty-three thousand million million miles. Thus, such a star appears to the Earth, not as it is now, but as it was four thousand years ago; and if a being on the star at this time had the sense of sight sufficiently powerful to behold the history of this Earth, he would see the events which occurred four thousand years ago. And if he possessed the faculty of passing through the intervening space in one day, or in less, the history of four thousand years would be brought together within the lapse of a few hours, or of a few minutes, or of one second. And if he used the speed of light in passing from the star to the Earth, or from the Earth to the star, a momentary event in one of the two spheres would remain fixed to his sight during his transit of four thousand years.*

The distance of other stars requires twenty thousand years for light to pass from them to the Earth. All these stars belong to one system or cluster, but other astral systems scattered at immeasurable distances through boundless space, appear to the Earth as they existed millions of years ago. From this Earth therefore, as from other spheres, the aspects of nature in former epochs extending over myriads of years, are for ever radiatory or spreading in concentric circles through infinite space. When this Earth in all its epochs is fully known, its adaptation to one purpose will doubtless be manifest, and this knowledge of the Earth will be much modified or comparatively "done away," when the sun and all the planets are equally well understood. This last degree of knowledge will be still more changed when it is combined with that of the millions of stars which form one astral system. But there are innumerable other astral systems, and as each of them is successively understood, the knowledge previously acquired will be altered as well as increased. It thus appears that time is wholly controlled by space, and may be arres-

* See "The Stars and the Earth." Bailliere, 219, Regent Street, London.

ted or fixed for ever; or millions of years may be concentrated in one moment, or one moment may be expanded to millions of years, according to the extent of space and to the quickness with which it is traversed. And to a being who is always the same in all epochs and in all places, or in eternity and infinity; all time and all space are alike present.

“Nothing is there to come, and nothing past,
But an eternal now does always last.”

The future, as will appear is the sequel, being wholly ordained, and foreseen, and arranged in systematic accordance with the past. Taking this Earth, or any other sphere, or the whole visible creation as a centre, space can in some degree be imagined as widening around on all sides infinitely, and as including both height and depth; the latter words like sun-rising and sun-setting, being deceptive, and only used as conventional terms. Reflections on the continual circles in which the aspects of creation since its beginning, or for millions of years, have been expanding in space with the speed of more than a million of miles in one minute may tend to enlarge the mind, but these extensions do not properly form a part of infinity, for their progress can never diminish it, and, having had a beginning, their bounds must always be definite and limited. But with regard to a Being who possesses infinity, it is obvious that all the past and all the future are ever present, and that the present never will pass away.—2 PETER, iii, 8.

Infinity before creation is manifestly incomprehensible to man, creation being the basis or support on which the mind rests in thought.

“Je ne vois qu’un grand cercle où se peut non regard,
Dont le centre est partout, et les bords nulle part.”

A future eternity and infinity, being accompanied by a future visible and eternal creation, is apparently more comprehensible than a preceding eternity and infinity; for though the term millions may be applied millions of times to the past epochs and to the extent of the present creation, still its beginning and its bounds shew that it does not form part of or diminish eternity and infinity. In the number of atoms, or of grains of sand, the words millions of millions of millions might be repeated millions of times; yet the number has its limits, and therefore the cessation of one atom will make it less; but no length of time or extent of space can make any difference in eternity or in infinity.

The incapacity of the mind is not more apparent when it cannot grasp the whole system of creation, than when it despises the most minute objects of created life. It was before observed that all the past time may again be comparatively present, and that all the extent of creation

may be concentrated in one point. On the other hand, as time has no appearance in the future; so, in the first existence of all creatures there is no space, the development of life in each being, when it is visible, having commenced by the assimilation of matter. But, as it is often declared in the Bible, and, as is also apparent from the fact of all the past being wholly in accordance with one system, the future, with the lives of all creatures in every particular, and, consequently, with the rise and progress, and attainments and reverses of every nation, and with all the lesser events therein contained, is all pre-ordained and arranged by the Deity, and is as fully developed in His sight, as is the past time and the past creation.

The beginning of individual existence, as has just been observed, is a mystery to man, and the creation of species a still greater mystery; but the beginning of creation, and how it was added by the Deity, who ever fills all space, is far more unknown to him. But the unity in the origin of creation is evident from most compounds of matter being comparatively modern, and from there being so very few simple substances. It is well known that there is but one agent or means in the change and development and organization of matter; and this, in all probability, was the secondary cause in the first production of matter. The names of this agent, as electricity, magnetism, and gravitation, denote its various properties; and its effects also appear in the earthquake and in the volcano. It is so evidently the medium between the operations of the body and the suggestions of the soul, that several speculative persons have confounded it with the mind in man.

VORACITY OF THE WOOD-PIGEON.

"THERE was shot lately, in the neighbourhood of Inverness, a Wood-pigeon, in which was found the enormous quantity of one thousand one hundred grains of wheat, barley, and oats, together with forty grains of peas; the barley grains predominating. This seems to be no unusual case, as there was some time before that, another killed on a neighbouring farm, in which were found seventy grains of peas, with a very large quantity of the different kinds of grain already mentioned, but the precaution of counting was not taken: it was stated, however; that the bird was full to the very bill. Such havoc, by a flock of one hundred and ninety or two hundred of these destructive birds, must be very considerable in the course of a whole harvest-season, particularly since some ornithologists maintain that such are the digestive powers of the Wood-pigeon, that they are able to consume daily three times their own weight of food; a most extraordinary fact, if true. It is needless to add that the

extermination of such birds must be highly desirable on the part of the farmer."—*Inverness Courier: copied into The Times, October 22nd., 1857.*

The above broaches a wide and difficult subject, which I had occasion some months since to consider with reference to the feline race. Every person of humanity must be anxious to avoid the unnecessary destruction of any living thing, and with such only would I discuss the subject. We are all the work of the same Almighty Power, and we know very well that "not a sparrow shall fall to the ground without God's knowledge:"—ST. MATTHEW, x. 29. At the same time it is declared in the earliest passages of Scripture, first in the twenty-sixth verse of the first chapter of Genesis, and in other verses, that man should have dominion over every living thing, and that all fruits should be for him for meat; and then in the third verse of the ninth chapter, that every moving thing that liveth should be meat for him, Noah and his family then representing the whole human race.

It is needless to say how this has been, and is acted upon, until, as Mr. Wood in his pretty little book of "Common Objects of the Sea-shore," expresses it, there are some people who would fry a rainbow if it were possible. Meantime reason must be our guide, although of course it is difficult always to know where to draw the line. We must admit that butchers' meat, poultry, and game are legitimate articles of consumption, and the rationale is, that whatever is wholesome food was, *primâ facie*, made to be eaten, for when we come to animals of prey they are uneatable. There is therefore one class of beings made fit for human food, and therefore it is lawful to deprive them of life (under the sanction of Scripture) for that purpose.

Then comes the question in dispute—how far is it lawful to destroy animal life for any other object? Being in an artificial state of existence, as contra-distinguished from animals, man often finds that, for his own preservation, those animals which infringe on his support or his safety must be sacrificed, and, I think, we must conclude that he is justified so far. Then follows a refinement on this necessity, namely, their destruction for the purposes of science; and this, I must say, I think stands upon a somewhat doubtful footing, although the importance of the subject has erected it into a received practice, and I do not in the least question that in some instances it is perfectly justifiable; but I beg most distinctly to enter my protest against any species of cruelty, that is, giving pain, and not at once killing, which is too often resorted to under colour of this pretext.

There is still one other branch left to consider, which is a greater refinement still, namely, the taking away life for the purposes of luxury. Now surely, to say the least of it, this is quite unnecessary, and is, on a smaller scale, like the feast of nightingales' tongues in ancient times,

or goose livers of our own day. If animals individually insignificant are at the same time a delicate viand, when destroyed let them be eaten, or destroyed to be eaten, but when they cannot possibly form a meal, and are only applicable to please an epieure's appetite as a novelty, let them be spared, as such a satisfaction cannot be placed against the taking away of life.

To apply this to the case before us of the Wood-pigeon. Its great powers of appetite and digestion are too well known to need the above evidence. I have fed domestic pigeons on horse-beans as hard as stones, up to the very bill, and given him a shake to make them rattle, which they did lustily, but certainly next morning he was ready for another meal; and I do not suppose that the wild bird differs in this particular from the tame. Pigeons in America, we have read of with wonder, and there is no reason to doubt the fact, American though it be. Of course we have no such numbers in England, nor, I should think, in Scotland, but in deep autumn the flocks are very numerous, and I have myself seen, I should say, on two occasions, some eighteen or twenty thousand in a flock at a moderate computation; but these were rare instances, and the flocks, though very numerous, were usually of not more than forty or fifty birds each, and these performed a regular journey at about seven o'clock in the morning and five in the afternoon, out and in from Windsor Park to some other locality west of it, where I do not know, and many a one fell in passing us; of course we watched for their transit. They were fine birds, and I think, as well as I remember, we sometimes found them filled with beech-nuts and turnip-greens, and sometimes with corn of various kinds. On the occasion of the transit of the large flocks I mention, we were so unprepared that three ramrods were broken in no time, in our hurry and trepidation, and from the same cause only two birds fell. Since that time the plantations have grown up over that country, and they breed almost everywhere, so there are no more armies. They are excellent eating, and if destructive must of course be in turn destroyed; but this will seldom hold good as a general proposition, so, when we have had our pie, lean to the side of merey, say I.

O. S. ROUND.

Pembroke Square, Kensington, October 29th., 1857.

NATURAL HISTORY OF NUNBURNHOLME.

BY THE REV. F. O. MORRIS.

"GLORY BE TO GOD" was the frequent saying of good old Bishop Ken; and with this I will begin, and with this I will end. Abundant reason as will be seen, I have to do so.

Ever since I have been in Holy Orders, though I have lived in the country, and in the country only, yet it has always, till now, fallen to my lot to have the care of a large parish, while the superintendence of a small one has been the object of my wishes. It is not, however, for the clergy to choose as they would in all respects for themselves. "It is good for a man that he bear the yoke."

But, most unexpectedly, and unasked, the Archbishop of York, on St. Thomas' Day, the very day for a "dole," wrote to offer me the living of Nunburnholme, which I did not even know was vacant, a place from the little I knew about it, though I never had been at it, it had before come into my thoughts would be exactly the one that would suit me, and that I should suit. I thankfully accepted the offer; and more thankful, if it be possible, I feel every day to his Grace, and to the SUPREME RULER of events—the "Head over all things to His Church."

Surely no one was ever so really suited to his mind—Whereas I had thought before that any such place would very likely be thrown away upon many a one who might have it, the utter reverse is the case with myself—no one would possibly appreciate more that which was just to his liking. "Glory be to God."

"I said if there's peace to be found in the world,
A heart that is humble may hope for it here."

Picture to yourself a moderate-sized Rectory-house, quite sufficiently large for comfort, but not overgrown, as one sees some houses which are built for show and effect more than for the proper ultimate end of architecture, (I always pity the dwellers in such,) but if you wish a model of a house, not altogether as to appearance, for that, I grant, might be improved, but one fit for the class to which I belong—the middle class, the happiest of all—do you doubt the former part of my assertion? I have Scripture for it—"Give me neither poverty nor riches—Feed me with food convenient for me"—I beg of you also not to doubt the latter part—come and look at Nunburnholme Rectory—I will shew any naturalist over my mansion and domain; he shall see my cabinets, and may be sure of a hearty welcome.

But I must first give some sort of general and particular description of the place itself.

In a brief account of the parish which I put forth on the cover of my "History of British Birds" in an address on the restoration of the quaint little parish church, which was responded to by many kind friends, more than one an "ami inconnu," unknown but known, as a lady in the south, whom I never saw, nor she me, said in a letter, "we know you quite well from your books."—I have got wrong somehow—how shall

I wind up or unwind this tangled sentence? I cannot well amend it, and I do'nt feel disposed to take the trouble of beginning it over again. I have it—thus: It is not too late for you, good reader, to contribute to the said fund, if you think proper to do so—that will do; a good sentence—a good paragraph altogether. Now to proceed. I say, in the account I put forth, I wrote as follows.

“The parish of Nunburnholme is situated at the end of a quiet and retired valley, in the East-Riding of Yorkshire, in the midst of some very pleasant scenery. The church is small, the population being only about two hundred and twenty. It presents some interesting features to the antiquary, having a remarkably fine and ornamented Norman arch, a small Norman west window, considered to be almost unique, one very large and curious double window, a fine east window, and two other good ones. The churchyard might have served Gray for the subject of his ‘Elegy.’”

Entomology.

EXCHANGING INSECTS.

BY C. R. BREE, ESQ.

THE publication of the “Entomologist’s Intelligencer,” has given a great impulse to the exchange of insects among collectors, and perhaps a few words upon the subject may not be out of place here.

In exchanging insects, by which local species get generally distributed among the various cabinets in the United Kingdom, we think there are several points which ought to be strictly observed. In the first place we think it ought to be distinctly understood that none but insects in a good state of preservation ought to be sent out unless under special or exceptional circumstances.

The transmission of insects by post is attended by considerable expense, and a box of bad insects is rarely worth the carriage. The exceptions are when an insect is of great rarity, or where it is difficult or almost impossible to get it in good condition. But this ought always to be stated in the correspondence, which as a matter of course precedes the exchange, so that each party is in possession of the terms of the implied contract.

We believe, and hope still more, that the instances are rare in which bad or injured specimens are sent wilfully.

If such a case is clearly made out, we think the person who receives them is quite justified in returning the box without touching the contents, or paying the return postage. One general fault among all young

collectors is that of bad setting, which renders it necessary to relax the specimens, a process which frequently spoils, and generally takes off that freshness and bloom so much prized in the cabinet.

On this point we shall next month give an admirable paper, by the Rev. J. Greene, by studying which every one may insure good setting.

In the second place we think that with the insects sent, there ought to be always a list of names, and where possible, a little history of the locality and œconomy of each insect. Such information is always acceptable, and tends much to diffuse a general knowledge of Entomology.

Thirdly, we need hardly say that every person ought to keep good faith with his correspondent. We do not think that a breach of faith is frequently wilful. Young collectors are often ignorant of the relative value of an exchange, and such persons ought to wait until they are more advanced, and can better make a return for the specimens sent them. We are not among those who think that the duplicates of a hard-working collector are to be sent to every one who may assert the claim of being a brother Entomologist. Putting aside the injustice of asking a person, who has toiled hard, often day and night for perhaps weeks, to give up his rare species to the first person who asks him, we think such a system, if in existence, would make the incipient rely upon others rather than upon his own exertions, and thus by producing idleness, obstruct the progress of Entomology. We therefore think that in all exchanges a *quid pro quo* is not only reasonable but just.

Fourthly, those who exchange insects ought always to write to each other with courtesy and gentlemanly feeling. Science is a "humanizer," and a "civilizer" of the mind. Though a republic, it is a republic of gentlemen, and mild, kind, friendly, and courteous language is the medium of communication between the members of such a fraternity.

We think that *all* letters which are sent in answer to a notice in any publication, ought to be answered either directly, or as soon as possible by another notice in the same journal. The omission of this courtesy is, we are afraid, not unfrequent.

Fifthly, we think that all collectors who have duplicates which they cannot or do not wish to *exchange*, ought to send them to those who want them, the recipient in such a case paying the return postage.

Such are some of the rules which we think ought to guide those who wish to increase their collections and knowledge by exchanging through the post office; and though it does not come within the scope of this Journal to insert lists of *duplicates* and *desiderata*, which is of the less consequence so long as the "Intelligencer" is in existence, yet we shall always have great pleasure in promoting the friendly exchange of insects among our brother Entomologists, knowing as we do, from experience, the pleasure it

creates, and the kind feeling which it often produces between individuals who would probably under other circumstances have been strangers through life to each other.

Lepidoptera near Bungay, Suffolk.—My father not having paid much attention to Entomology of late years, has commissioned me to forward you a list of the rare insects that have been captured in this neighbourhood.—*Colias edusa* is taken here occasionally, and in 1855 Miss Spalding captured two of *C. hyale* at Westleton. A few years since my father found *Melitæa artemis* in the greatest abundance in some marshes close to Bungay, but since that time we have never seen one there. I have taken it at Rockland in company with *P. machaon*. Of *Vanessa C-album* I have taken one in our own garden, the only one that I know of that has been taken about here for many years. Of *V. antiopa*, Mr. F. Spalding captured one at Ditchingham, in 1846, and his father caught one at Westleton this year, in August, and my father saw one at Ellingham about the same time, which, unluckily, he was unable to capture. *Arge galathea* is very plentiful every year at Ellingham, about three miles from Bungay.—WILLIAM GARNES, JUN., Bungay, Nov. 7th., 1857.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A., AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

PART II.—HETEROCERA.

DIVISION I.—SPHINGIDÆ.

GENUS *Trochilium*.—I did not meet with a single specimen of this genus during my residence in Suffolk.

1. *T. cynipiformis*.—One specimen taken at Buxhall, by Mr. Levett. (C.)

2. *T. myopæformis*.—Two specimens taken in an orchard at Battisford, near Stowmarket, by Mr. W. Baker. The larva, which is white and fleshy, like the rest of this genus, feeds under the bark of apple-trees in the autumn and winter, and turns to a pupa at the beginning of spring. It betrays its hiding-place by the frass. (C.)

3. *C. culiciformis*.—One specimen of this fine insect was given me by Mr. Garrod, of Ipswich, taken in 1856 in a wood near that town. (B.)

4. *Agria apiformis*.—Extremely abundant in the larva-pupa state.

The eggs are laid by the parent insect in the trunk of the tree, about four feet from the ground. When hatched, the larva burrows into the tree, and its presence may easily be detected by the frass and little hole in the wood, like that produced by a gun-shot. The larva must gradually work its way downwards, as the cases are always found either level with or below the surface of the earth. The case consists of little pieces of wood tightly matted together, and lined with a glutinous silk. Inside the larva passes the winter, not changing to a pupa until the end of April. Directions for finding these cases will be found in the third or fourth number of the "Intelligencer;" but they are extremely difficult to rear. I only bred one out of forty in my possession this summer. This, I think, was partly owing to the probability of their being injured in cutting them out of the trees, and partly to their not having received sufficient moisture. They must do great injury to the trees, as the poplars round Playford were quite honey-combed by them; and when I was at Sehwalback this year, I saw a number of young poplars, lately planted by the Grand Duke of Nassau, either dead or dying, while the young trunks were quite perforated with the little holes made by the larvæ of, I presume, this or an allied species.

N.B.—The pupæ of this insect require to be kept rather moist; they are then not difficult to rear. I have now and then had them by a dozen at a time from the Cambridge collectors, and have seldom failed to breed the perfect insect when I attended to the moisture. I think the best plan is to place them in a tin box, the lid of which fits pretty tight, about half full of slightly damp earth. It must be only *slightly* damp, or the pupæ will go mouldy. (C.)

5. *Æ. bembiciformis*.—The larva of this insect is common in the sallow stumps in this neighbourhood. It is difficult to rear from the larva, and even after the pupa is cut out it frequently dies. (B.)

6. *Sesia bombyliformis*.—Rare. (B.)

Taken at Ringshall, near Stowmarket, by Mr. W. Baker. (C.)

7. *S. fuciformis*.—Rare. (B.)

Taken at Ringshall by Mr. W. Baker. The larva feeds in June and July upon honeysuckle. When full fed, it is pale green on the back, brighter on the sides, the whole rugose, and minutely spotted with yellow; on each side is a pale yellow line from head to tail; the spiracular spots are red; the caudal horn is purple, lighter at the tip; the mouth, legs, and belly are purple, the latter edged with yellow; the head dark green. The pupa, which is a dusky purple, is enclosed in a slight cocoon amongst moss or the roots of grass. I beat a larva, when quite small, into my umbrella, June 30th., 1856. It was full fed, and spun up July 30th., and the perfect insect appeared June 6th., 1857. This insect, when bred,

has, like *Bombyliiformis*, the wings covered with a fine down, which is rubbed off the moment it flies. The larva becomes reddish when ready to spin up. (C.)

8. *Macroglossa stellatarum*.—Frequent in the summer and autumn. The larva feeds on *Galium verum*. (B.)

I took about twenty-six of the larvæ of this insect in August a few years since, in Bucks., in one field, feeding on *Galium verum*. They spun up and turned to pupæ in loose cocoons among moss and dry roots of grass, precisely similar to those of *S. fuciformis*. The pupa is a delicate pale drab. All mine produced Moths at the beginning of October the same year. I am convinced that this insect hibernates, and lays its eggs the following spring. Has no entomologist ever taken it in a dormant state? The larvæ from pale green become reddish when ready to spin up. (C.)

9. *Charocampa percellus*.—Not uncommon. (B.)

10. *C. elpenor*.—Common in larva state on *Epilobium*. (B.)

I once took about thirty larvæ on a small patch of *Galium palustre* in about half-an-hour. This is, I think, its favourite food-plant. I have once taken it on *Galium verum*, L., and have known it to be taken on *Impatiens noli me tangere*, L., *Epilobium hirsutum*, L., and *Circæa lutetiana*, L. (C.)

11. *C. celerio*.—Two specimens of this insect have been taken in this town. They fell into the possession of the late Mr. Peck. (B.)

12. *Deilephila galii*.—Two specimens of this fine insect were taken in this town in the present year; one ♂ by my gardener, when mowing the lawn in my garden, on September the 2nd.; the other, a ♀, was found on the gravel walk of a gentleman's garden, a quarter of a mile from my house, on the 4th. of September. Both specimens are in my collection. The larva has been taken by Professor Henslow at Felixstowe. (B.)

13. *D. lineata*.—One specimen taken by Mr. Garness, Jun., at Thetford, which, being on the borders of the county, may be noticed here; in fact, the Suffolk insects may, we consider, be fairly taken as representatives of the Entomology of the eastern counties. (B.)

14. *Sphinx convolvuli*.—I took three specimens in 1847 in my garden. I have not seen it since. (B.)

15. *S. ligustri*.—Larva not uncommon on privet and ash. Seems to be terribly exposed to the attacks of Ichneumons, its beautiful green skin being sometimes quite dotted with the punctures made by its ruthless enemy. Surely *S. pinastri* ought to be expunged from our native lists?

N.B.—I have taken the larva of this insect several times upon the mealy guelder rose, (*Viburnum lantana*, L.) and the common dogwood, (*Cornus sanguinea*, L.) The Moth apparently lays her eggs indiscriminately upon these two plants, and ash and privet, as I once took the larva upon all

four within a space of a few yards square. I have also known the larva to be taken upon *lilac* and *laurustinus*. The eggs may be found in plenty where the insect occurs on the under side of the leaves of *ash* and *privet*, at the end of June. (C.)

16. *Acherontia atropos*.—The larva is brought to me almost every season. In 1856 I had four, but I did not get one imago; in fact, I should be glad to hear if any *certain* method has been found for rearing this insect. A correspondent in the "Intelligencer" adopts the plan of drenching them once a week with water. As far as my experience goes, however, with other species of Lepidoptera, I should say that pupæ cannot be kept too dry. There are, I have no doubt, exceptions to this rule among marsh-plant feeders, but I *invariably* find when digging that the part of the tree where pupæ are found is that which is dry, and for the most part where wet has not penetrated for years. (B.)

17. *S. tilia*.—Very common in the pupa state, though I have only observed the larva very rarely. I was once asked, I think by Mr. Bond, whether I had ever bred an Ichneumon from the many pupæ I had had of this insect, as he had never known of one, to which I replied that I had *not*. It has always struck me as a very curious circumstance how subject some genera and species are to the attacks of Ichneumons, while others appear comparatively exempt. As illustrations of the former I may mention *Cerura* and *Notodonta*. As far as my experience goes, clear green larvæ seem most frequently to fall a prey to these parasites. What a benefactor to entomologists would he be, who might discover a method of destroying these horrid little creatures without injury to the unhappy larva. If I mistake not, Mr. Douglas records somewhere in the "Zoologist," one instance in which an Ichneumon caterpillar produced a Moth, the eggs of the Ichneumon having been extracted from the larva with a sharp-pointed instrument. Of this, however, I am not sure.

N.B.—The larva of this insect occasionally feeds on birch. I took one half-fed upon this tree last year, (1856.) It sometimes lays up under the loose bark of old elms. I found two pupæ this spring, (1857,) more than four feet from the ground. The larva, when ready to bury, loses entirely its beautiful green colour, and becomes a sort of dirty purple. As an incipient, I remember being very much taken in by finding one in this state. I thought I had got something quite new. (C.)

18. *S. ocellatus*.—Much the rarest of the three species; *sallow* is, I think, the favourite food of the larva, but it seems almost impossible to find one unstung.

This insect is, I think, in this locality equally common with *S. tilia*. (B.)

Last August, (1856,) I took a larva of this insect on the *Ontario*

poplar. It also feeds upon *apple*, *crab*, *willow*, and the various species of *sallow*. My brother took it in great abundance a few years since in Radnorshire, on *crab* in the hedges. I am compelled to differ from my friend Mr. Greene as to its *penchant* for Ichneumons. I have taken it for the last eight or nine years at least, but never yet found one stung. I may remark as a curious fact that a few years since I had a brood of eggs laid by a female *S. ocellatus*, of the union with a male *S. populi*. I reared the larvæ; the produce were *every one* genuine *Ocellatus*, without the slightest cross of *Populi*. The parents were bred by my brother, and were the only two insects in the breeding-box, so there could be no mistake. (C.)

19. *S. populi*.—Common. The perfect insect not unfrequently comes to light.

N.B.—I found a pupa of this insect this spring, (1857,) under the bark of an old willow, nearly five feet from the ground; it was enclosed in a cocoon of gnawed bark and rotten wood, similar to that of *Acronycta psi*, *tridens*, and *megacephala*. (C.)

20. *Anthrocera filipendulæ*.—Very common near Stowmarket. (B.)

21. *P. statice*.—Extremely local. Confined to one corner of a marshy meadow bordering upon Kesgrave Heath, about a mile and a half from Playford.

(To be continued.)

ABSTRACTS FROM THE "SPECIES GENERAL DES LEPIDOPTERES." PAR M. M. BOISDUVAL ET GUENÉE.

PART I.

Translated, with remarks, from the "Noctuelites Par M. Guenée," by C. R. BREE, Esq.

It is our intention in this and subsequent papers, to give our readers, who may not have access to the original works, some knowledge of the valuable labours of M. Guenée, probably the first of European lepidopterists. M. Guenée's arrangement is that, which, by common consent, seems to be adopted by entomologists in this country. Mr. Stainton has used it in his "Manual;" and we understand that so soon as the "Geometridæ" is published, Mr. Doubleday intends to issue a second edition of his "Synonymic List," founded on the elaborations of M. Guenée. In the meantime we cannot do better than make ourselves acquainted as much as possible with the works from which these classifications are taken. The following is M. Guenée's general description of the *Noctuæ*.—Ed.

HETEROCERA.—DIVISION VI.

NOCTUELITES. (*Noctuæ*, Linn.)

GENERAL CHARACTERS.

Larva elongated-cylindrical, with six scaly legs, the two anals constant; ventrals varying from four to eight, never inclosed in sheaths, or contained between the two membranes of leaves; living solitarily, at least in adult age, on leaves, in pith, or roots. *Chrysalis* unarmed, smooth, never attached or suspended. Abdominal rings free; form conical, terminating in a hook or spine. Contained in exterior cocoons, or in cavities formed in the earth.

Imago with antennæ long or middle-sized, growing less from base to apex; filiform, ciliated, or pubescent; more or less pointed or rounded, never terminating in a hook. Those of the ♀ nearly always simple; *labial palpi* only visible, well-developed, passing more or less beyond the head, the last joint distinct, nearly always less covered with hairs or scales, and always slighter, than the preceding joint. Two stomates constant; the spiral tongue more or less long or strong, but never completely absent.

Body generally robust; more squammose or velvety than woolly; often crested. Abdomen never furnished with down susceptible of detaching itself after the laying of eggs in the females. Legs of a variable length, but generally long, above all, the last or hind pair, which are always longer than the preceding. Anterior legs shorter, and furnished with a distinct epiphysis; the middle legs furnished with one pair, and the posterior with two pairs of spurs well developed.

Wings large, never raised in repose, or rolled round the body; well furnished with scales; the superior wings nearly always marked with three lines and two distinctive annular spots or stigmata.

Inferior wings more or less folded; generally covered by the superior.

Nervulation. Superior wings. Sub-costal nerve constantly furnishes three nervules and three costal branches an areola, (wanting only in one family and one genus,) well closed, always unique, placed above the cell, of which it is entirely independent. The median nervure quadrifid, the sub-median simple; never an intermediate. *Inferior wings.* The sub-costal nervure always elbowed with the costal, (except in one family,) only admitting between the two three nervules; the median trifid or quadrifid, according to circumstances; no pre-costal or intermediate.

The *Noctuelites* above characterized may be placed indifferently either after the *Bombyces* or the *Geometræ*. They are connected with the first by the *Noctuo-Bombyces*, and the *Bombycoides*, and with the last by the *Anthophilides*, the *Erastrides*, and the *Phalenoides*. If the last arrange-

ment is adopted, which would have the advantage of leaving linked together without obstacle the *Noctuelles*, the *Deltoides*, the *Pyræles*; and the *Micro-Lepidoptera*. The *Geometræ* must be connected with the *Bombyces* by the genera *Amphidasis*, *Nyssia*, etc., which are true *Bombyx* Pioneers, (*Bombyx arpeneurs*;) and to the *Noctuelles* by the above-mentioned families. But up to this time all authors have placed the *Noctuelles* immediately after the *Bombyces*, and when I reflect that in upsetting this order so long adopted, there would be as much inconvenience as advantage, I feel but little disposed to make the innovation.

It is besides, now universally acknowledged, that though the arrangement of species upon a single line is imperiously commanded for the convenience of publications and collections, it is not in complete harmony with the footsteps of nature, who appears to have proceeded in groups linked one with another, nearly without any regular succession; it is therefore very often immaterial which of them is made the commencement. But if there is one division which cannot be separated from the *Noctuelles*, it is that of the *Deltoides*, between which groups the transition is scarcely perceivable; so that it appears to me absolutely necessary to make them follow immediately afterwards. If this necessity has not yet been felt, it is that till now the systems have been formed upon European species, and the transition of which I speak are generally met in the Exotic species. I think the examination of my last family will completely evince this truth. The *Noctuelles* pass then from the *Bombyces* to the *Deltoides*, by a succession of intermediate shades; and just as the *Pseudo-Deltoides* approach the last, so the *Pseudo-Bombycoides* are allied to the *Notodontidæ* and the *Pygeridæ*.

I must anticipate an objection which will certainly be addressed to me—that of the multiplicity of the genera. Many persons, strangers to Entomology, will in reality be frightened at the number which I have been obliged to introduce into this division of *Nocturnes*, and it will perhaps be useless to try to prove to them that I have never created any except against my will: it is, however, perfectly true. It will in reality always be easy to reduce these genera to a very limited number, and I have myself shewn the way by my division into families,* which may be considered, if so preferred, as the true genera, by reducing the actual

* These families have had till now, in Lepidopterology, the name of Tribes. But as this denomination is contrary to all ordinary rules in other branches of Zoology, Botany, etc., I have thought it better to change it before it becomes too old. My old tribes, in fact, correspond to the families of Jussieu, and besides which, language, which one would not wish unnecessarily to offend even in technical works, demands that the group which bears the last name, should extend further than that which is designed by the first. I have therefore reserved the name of Tribe for the larger sections which follow the *Phalanges*, and each of which comprehend a certain number of my actual Families or ancient Tribes.

generic divisions into sub-genera. This is only a change of words, and I state beforehand that I have no *amour propre* in these sort of questions. This reduction would be still more easy, inasmuch as I have given as much as possible to the Family a name derived from the principal genera contained therein. Having made these reservations, I will explain my classification in a few words.

I divide first the *Noctuelles* into two *Phalanges*, which I name *Trifidæ* and *Quadrifidæ*. These *Phalanges* are again divided into Tribes—three for the first, and eight for the second phalanx. These Tribes enclose Families, as I have just stated, and each Family is divided into genera. A genus is often sub-divided into groups, which again are split into sections. Many of these groups are certainly destined eventually to form genera.

The following tables will show at a glance the arrangement of M. Guenée, as far as the British Tribes and Families of *Nocturnæ* and *Pyrælitæ* are concerned.

HETEROCERA. DIVISION VI.—NOCTUELITES.

Phalanges.	Tribes.	Families.
1.—Trifidæ.	1.—Bombyciformes.	<ul style="list-style-type: none"> 1.—Noctua Bombycidæ. 2.—Bryophilidæ. 3.—Bombycoidæ.
	2.—Genuinæ.	<ul style="list-style-type: none"> 1.—Leucanidæ. 2.—Apamidæ. 3.—Caradrinidæ. 4.—Noctuidæ. 5.—Orthosidæ. 6.—Cosmidæ. 7.—Hadenidæ. 8.—Xylinidæ. 9.—Heliothidæ.
	3.—Minores.	<ul style="list-style-type: none"> 1.—Acontidæ. 2.—Eratridæ. 3.—Anthophilidæ. 4.—Phalenoidæ.
2.—Quadrifidæ.	1.—Variegatæ.	<ul style="list-style-type: none"> 1.—Plusidæ. 2.—Gonopteridæ.
	2.—Intrusæ.	<ul style="list-style-type: none"> 1.—Amphipyridæ. 2.—Toxocampidæ.
	3.—Limbatæ.	<ul style="list-style-type: none"> 3.—Stilbidæ. Catocalidæ.
	4.—Serpentinæ.	<ul style="list-style-type: none"> 1.—Ophinsidæ. 2.—Enclididæ. 3.—Poaphilidæ.

HETEROCERA. DIVISION VII.—DELTOIDES.

FAMILIES. 1.—Hypenidæ. 2.—Herminidæ.

HETEROCERA. DIVISION VIII.—PYRALITES.

Tribes.	Families.
1.—Squamosæ.	Odontidæ.
2.—Pulverulentæ.	{ 1.—Pyralidæ.
	{ 2.—Cledeobidæ.
3.—Luridæ.	{ 1.—Ennychidæ.
	{ 2.—Asopidæ.
	{ 3.—Steniadæ.
	{ 4.—Hydrocampidæ.
4.—Plicatæ.	{ 5.—Botydæ.
	Scoparidæ.

(To be continued.)

Reviews.

The Natural History of the Tineina. Vol. 2, containing Lithocolletis, Part

1. By H. T. STANTON, assisted by PROFESSOR ZELLER and J. W. DOUGLAS. London: VAN VOORST.

THE first volume of this important work was published in 1855, and comprised the *Nepticula*, Part 1, and *Cemiostoma*, Part 1, with eight coloured Plates of the larvæ, food-plants, cocoons, and perfect insects of twenty-four species of these interesting and beautiful moths.

The volume before us is a continuation of the history of these little gems among the smallest of the *Lepidoptera* family. The larvæ and insects of twenty-four species highly magnified, (and also natural size,) of the family *Lithocolletis* are given with much fidelity and beauty of execution. The drawings of the perfect insects are by Mr. E. W. Robinson, and the larvæ partly by the late Mr. Wing and Mr. T. D. Scott.

The letter-press, extending to 312 pages, is written in four languages, English, French, German, and Latin, in parallel columns. It consists of general observations upon the genus *Lithocolletis*, including a catalogue of the seventy-six species already known in the world; an arrangement of the larvæ according to the food-plants—a new and most interesting feature in the work; and a valuable chronological history of the literature of the family. The rest of the volume is occupied with a minute description of each of the twenty-four species illustrated; the heads of which are—The larva, how noticeable—The imago—Mode of life—Description of the imago—Description of the larva—Geographical Distribution—Synonymy and Observations of Authors.

Few people are aware of the exquisite beauty of these small moths. To the naked eye their minuteness frequently conceals them from observation, even that of the Naturalist; but if any of our readers wish to have a rare treat, we advise them to look at any of the genus treated of in this

volume through a lens of moderate power, with a good light. He will hardly know whether most to admire the brilliancy of colour, the graceful symmetry of form, or that delicate yet perfect organization which gives such a charm to these creatures in the eyes of those who study Nature to satisfy the intellect, as well as to gratify the senses.

We heartily recommend this volume to our readers. Vol. 3, partly already in the press, will contain twenty-one species of the grass-feeding Elachistæ; Vol. 4, the genus Coleophora; and Vol. 5, either the genus Depressariæ or a further portion of the Nepticulæ, with some of the genus Bucculatrix.

The work is exceedingly well printed, and ample attention has been afforded to details.

Nine Botanical Diagrams, Prepared for the Department of Science and Art. By the REV. PROFESSOR HENSLOW. Size, $40\frac{1}{2}$ by 29, fully coloured. Drawn from Nature, and on zinc, by MR. W. FITCH.

THIS series of Diagrams, following in the wake of those by Marshall on Physiology, Patterson on Zoology, Drew on Astronomy, etc., will prove a most useful addition to our means of making science a portion of popular education. Each of the Diagrams before us contains beautifully coloured sections and dissections of the typical species; illustrating each genus of Phænogamous plants, and the various parts of the flower, stem, seed, or root, are distinctly shown. Each Diagram contains marginal references to the letters and numbers, indicating the minute anatomical parts of the plant. They are executed in the first style of modern art, and will prove most useful to the student in botany, as well as in their intended more general application to the teachers of this delightful branch of natural science in our village and other schools.

We understand the Professor intends to publish a small work to explain them to the student more thoroughly, and to illustrate his system of "Village School Botany."

Miscellaneous Notices.

"On Monday morning last, a young Whale, of the species *Balænoptera Rorqual*, was discovered on the rocks behind the outer pier. It is supposed to have been left there by the tide of the previous night, as it was quite dead when found. This monster of the deep was upwards of thirty feet in length, and nearly fourteen feet in circumference at the thickest part of the body. A party of fishermen who found the prize, soon commenced the work of dissection. The outer skin was exceedingly tough,

and under this was the fatty substance from which a considerable quantity of oil would be obtained. The skin on the back was quite black, and had the appearance, when wet, of polished leather; on the belly it was of the purest white. This fish was, we believe, the largest that has ever come ashore here, though many of the same kind, and much larger, are frequently seen by the herring-fishermen when off at sea. Like the fishermen, they are probably in quest of the herring, which, with other small fish and mollusca, constitutes the food of this species. The Rorqual is not unfrequently taken on the most northerly coasts of our island, especially in the inlets of the Scotch coast, where they are, indeed, frequently the special objects of search and capture, their presence being indicated very often a considerable time before they are taken. The present specimen is supposed to have been dead some days previous to its being washed up here. Its stomach contained a quantity of herrings."

Ornithological Notes.—The mildness of the weather and the lateness of some of the broods have caused many of the swallows and martins to remain through the first week of October. Several Snipes, both the Common and the Jack Snipe, have appeared in the Dearne valley, and on the 5th. of September that rare bird, the Great or Solitary Snipe, was shot on the Fleets, being the first instance recorded in this neighbourhood of its being seen. It was taken to Mr. T. Lister, and its weight being twice that of the common species, it was readily distinguished as the rarer bird. A goatsucker or nightjar was twice seen near the same place and time, and favoured by the screening trees, it fortunately escaped the gunner. Less favoured than this rare bird, a much scarcer one, a male Honey Buzzard, was shot by the keeper of Sir L. S. Pilkington, of Chevet Hall, on the 9th. of September, while attacking a wasp's nest, its crop being filled with grubs, young wasps, etc. This noble hawk was once as useful in checking the increase of this noxious insect as Owls and Kestrels have been for destroying vermin. But all are doomed alike to extermination.—*Wakefield Express*.

Late Breeding of the Greenfinch.—On the 30th. of August last, in a garden about six miles north of Patrinton, I was shewn a Greenfinch's nest containing four full-fledged young ones. Is not this an instance of late breeding, as it is fully a month later than any case that I ever observed in this neighbourhood?—R., Wortley, Leeds, October 10th., 1857.

The Wryneck.—A fine specimen of the Wryneck, (*Yunx torquilla*), was found a few days ago on the Glasgow and South-Western Railway, near Thornhill, Dumfriesshire. It appears to have been killed by flying against the telegraph wires, and has been stuffed for the Thornhill Museum.—W. G. GIBSON, 75, High Street, Dumfries, October 21st., 1857.

Occurrence of the Pomerine Skua in Norfolk.—On the 28th. September last, a magnificent specimen of the above rare Gull was shot at Marsh-ton, Norfolk. It is an immature male, in that stage of plumage from which the late lamented Mr. Yarrell took his figure in his valuable work on the Birds of Britain.—S. P. SAVILL, JUN., 13, Regent Street, Cambridge.

Great Skua, (Larus cataractes.)—On Thursday last, 9th. October, 1857, some boys caught a bird on the road at Cottenham, Cambridgeshire, which proved to be a female of the year of the above.—Idem.

Common Tern, (Sterna Hirundo,) shot Inland.—A farmer shot one of these truly sea-birds when resting on his cow-lodge, on the afternoon of Thursday, October 8th., 1857, at Hardwick, Cambridgeshire, driven thither far from its native home by the late heavy gales.—Idem.

Ring Ouzel, (Turdus torquatus.)—A labouring man shot one of these birds, a male, which was sitting at the time upon a plum-tree in Cherry Hinton chalk-pits, Cambridgeshire, September 6th., 1857. This is exceedingly early for their appearance in this county.—Idem.

Since penning the above, I have received notice of an adult Pomerine Skua, (*Lestris pomerinus*;) also an Arctic Skua, and three pairs of Great Skuas, (*Larus cataractes*;) shot on the coast of Scotland by some fishermen, who were at the time herring-fishing there, were bought in the market at Great Yarmouth, Norfolk.—Idem.

Sphinx convolvuli.—I took a fine specimen of this fly on the 7th. of September, on a post, just out from its chrysalis.—ARTHUR HAVERS.

The Spider.—The other day I was passing through my kitchen, when my servant drew my attention to a Spider which had descended from the ceiling, crawled along the table-cloth for a few inches, caught a fly, and was again ascending its web to the ceiling. I saw it ascending with the fly in its claws. My servant saw it in the act of holding or seizing the fly on the cloth, as it was the buzz of the fly on being caught that attracted her attention. Is not this a curious proceeding for a web-spinning Spider?—Idem.

The Querist.

Can any of my—I beg pardon, our—Entomological readers tell me which is the best part of the New Forest for Entomological operations, which the best time of the year there, and where a poor man, a working Entomologist, could obtain suitable accommodation, and at what rate?—F. O. MORRIS, Nunburnholme Rectory, Hayton, York, October 2nd, 1857.



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Member of the Ashmolean Society, etc.

THE ENTOMOLOGICAL DEPARTMENT

BY C. R. BREE, ESQ.

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the earth is full of Thy riches.—PSALM civ., 24.

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*** All communications on Entomology intended for insertion in this department of “The Naturalist,” must be sent before the 15th. of the month to C. R. BREE, Esq., *Stowmarket, Suffolk.*

ERRATA IN DECEMBER NUMBER.—Page 277, seventh line from top, for “*of the union*,” read “*after the union*.” Page 280, second line from top, for “*amour proper*,” read “*amour propre*.”

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VOL. VIII.

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O LORD, how manifold are thy works! in wisdom hast Thou made them
all: the earth is full of Thy riches.—Psalm civ., 24.

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THE NATURALIST.



ON THE NATURAL ORDER OF ANCIENT GEOLOGIC ORGANISMS.

BY F. M. BURTON, ESQ.

EVERY student in zoology, who has at all examined the systems of our great naturalists in the past and present time, is doubtless at first invariably struck with the want of a pure classification of the Animal Kingdom, that will shew without fail the gradual increased development of one creation over another, in at least one important organism; and looking at the inconsistencies that prevail throughout nature in this matter, he is apt to think that the true classifying principle has not yet been discovered, that the master minds that have from time to time attempted to elucidate the secrets of nature, and to separate the true gold from the rock where it lies buried, our Cuviers and Owens have yet failed to find out the key which will give access to the whole, the one true principle of all organic created matter. He remembers that nature never recedes, and this is apt to confound him more, and further strengthens the belief he fosters, and then a spirit of inquiry is raised within him, and he searches deep into the works of those who have made zoologic development, as it exists in the present fauna of the earth, their study, but without getting nearer the goal. He then recollects that the whole world of organisms, as it now exists, is merely a portion, part decaying, part decayed, of one vast fabric of creation, which has been going on for ages, and then he takes a wider sweep, and endeavours to understand the link between ancient and modern cycles, as shewn in the geologic records of the past, and here he sees at last nature as a whole, and finds what man's wisdom has discovered, though failing in perfection, is yet worked out on true creative principles.

But to put the question in a more forcible light, let us take the several great divisions of the Animal Kingdom according to modern classification, and compare them one with another, and then let us mark how it is that we do not find the lowest class of one division higher in point of organic development than the highest of the last class, as, for instance, the Annelidæ, the lowest of the Homogangliate division, over the Echinoderms, the highest of the preceding Nematoneurose division. The answer to this, when

viewed by the experienced eye of the advanced geologist, is obvious.

In the first place it must be borne in mind that it would not be necessary, from local causes, that the lowest class of one division, and each tribe of animals, should in all respects be more fully organized than the highest preceding lower class or tribe, because the development of one or more organisms would entirely depend upon the circumstances of life in which each animal is placed; the inhabitant of the water, for instance, would not require certain senses and organs so highly elaborated as those of another species whose habits were terrestrial, and *vice versâ*. But the chief answer to the inquiry lies in this, and the fact has been partly worked out and elucidated in the last work of one of our great geologists, whose end we all lament, that of "The Testimony of the Rocks," by Hugh Miller, who makes the simple statement that the various creations, so to speak, of the different divisions of the Animal Kingdom were an act of parallelism. Too much stress cannot be laid on this important fact. This is the key which will unlock the truth of advanced systems, and throw a light over the whole, when we come to consider that the lowest organisms with which we are acquainted were the first to be developed, and that, when the great Silurian sea was in being, with its muddy, slimy shores, the acritous animals held sway. True it is we cannot find traces of the remains of many, whose types of form we still are acquainted with in existing life, in the rocks where now their history is read, but the reason of this is apparent—their bodies were evanescent, and no more traces of them could have been left than of the soft jelly-fishes of our own shores, which, when thrown up by the waves, before the returning tide can reach them, are melted by the sun's rays, and disappear.

But were acritous animals alone permitted to live on those ancient shores? Nature, ever bountiful, and delighting in liberality, or rather nature's consummate Author, willed it otherwise. Co-existent with acritous development appeared also tribes of the great Nematoneurose, Homogangliate, and Heterogangliate divisions,—nature worked in parallels. Together with the bony secretions of Polyyps, we find Trilobites and Brachiopodous Molluses, nay, from the soft nature of the lower orders allowing them to perish without an impress of their form, the latter kinds almost appear to predominate. And further, in addition to this divisional creative parallelism, it appears that in the four first kingdoms a certain parallelism also existed in the several classes composing each division, as, for instance, among the Heterogangliata; for, co-existent with low Brachiopods, we find imbedded in Silurian stone remains of the highest families of this division, Cephalopodous Molluses, animals that approach the vertebrate world in type by the possession of the first rudimentary bony skeleton, though again we are confounded in our attempt to understand the creative truth by the light

of discovery, in the fact that the lowest class of the Heterogangliate division does not make its appearance till the tertiary system was being formed, in other words, not for numberless unreckoned ages after the highest Molluscan genera had been called into being.

But all this, it may be urged, does away with the six days of creation, either as literal or prophetic periods. No such thing; nature's own testimony, engraved in ancient rocks and cliffs, is to the contrary; any tyro in geology knows to the contrary, and can tell you that great eras of development were elaborated in successive periods of the world's history, that, notwithstanding the appearance of lower orders of the higher animal divisions during the aeritous sway, they were merely the forerunners of a nobler world afterwards to be perfected, and that the successive but continuous deposits of the Silurian and other systems, speaking of them as periods of time, were the eras of greatest development of different tribes of animals.

And when, it may be asked, did the last and highest kingdom appear? Its creation began in the days of the Upper Silurian age, when water prevailed over the surface of the earth, when the coral of aeritous Polyps was in a high state of formation; it began with the lowest class of the vertebrate division, tribes which alone could live in that watery age, when higher genera would, like Noah's dove, have found no rest for the soles of their feet, an age adapted entirely to fishes; and afterwards, when the dry land began to appear, in the time of the uppermost deposits of the old red sandstone, then those great monsters, whose bony remains may be found imbedded in such numbers in our liassic and oolitic deposits, those

"Dragons of the Prime,
That tore each other in their slime,"

appeared with it. Truly nature never receded, but from the time when God first clothed the material world with life, till the day of perfection arrived, when He placed the pinnacle on the noble structure He had raised, and formed the spirit of man within him, and fitted him to serve and worship Him, nature never receded. God's work was complete, but it was left to man to recede. It is a beautiful fact, fully in accordance with geologic truth, that, when God had finished all His work, "behold it was very good," and that man, now, alas! so degraded, was good too, a fitting head to such an edifice. God formed him perfect, but from that original righteousness, from his high estate, puffed up with pride, and seared with ingratitude, man himself receded and fell; and I know not whether there is a more striking proof of the mighty foresight and wisdom of God than that, though He had made him perfect, and doubtless meant him but for his rebel sins to continue so, still, foreseeing the dire calamity of his fall,

He had, during the successive preceding periods of creation, so framed the crust of the earth, with its coal forests, its minerals, rocks, and soil, that it was at once ready for a fallen race, only requiring that labour to bring it out, that toiling sweat of brow to keep down the rugged crops of thorns and thistles, which was one of the merciful fruits of man's rebellious sin.

Uppingham, November 4th., 1857.

CHARACTERISTICS OF COMMON BIRDS.

BY O. S. ROUND, ESQ.

(Continued from page 223, Vol. vii.)

BIRDS, like other wild animals, are divided into classes pursuing various modes of life, each path exercising a manifest influence upon their manners and appearances, the search after food to sustain that life being the great motive power whereby their movements are regulated. Hence, whilst the graminivorous are walkers and runners, because their food is gotten on the earth, so the insectivorous are endowed with extraordinary powers of wing, and the aquatic birds are web-footed. But there is one class, which is, perhaps, the most limited number of all, which subsists upon nocturnal prey, and the reason for this is obvious, for nocturnal animals are likewise comparatively few, and in this, as in all nature, we find that all-wise adaptation of the means to the end that must strike the most unobservant at every turn in the pursuit of natural science. Almost all night-birds are garrulous, for although their ocular powers are far superior to our own, or that of diurnal creatures, for distinguishing objects during the hours of darkness, still, to a great extent, it is darkness even to them, and they cannot see each other at any great distance, and it is therefore necessary that they should have some other means of collecting their forces, or of knowing each other's locality. Thus, as we all know very well, Owls hoot and scream, Nightjars rail, and Stone Curlews whistle, and Herons, which are somewhat nocturnal, have a note approaching to a shriek, whilst the Bittern utters a harsh note like a trombone. Nay more, birds which are strictly diurnal, particularly water-birds, when they do move at night, which sometimes chanced, immediately become noisy, and for the same reason as I have above stated; and who knows but that, like many a youth-would-be-man who manfully starts to walk home across a common after nightfall, the silent darkness has not something awful and fear-inspiring even to non-reasoning creatures; and as he makes the air echo with his whistle, so they awake the stillness in their own way. It has been advanced by a divine of superior talents, who met an early grave from over-exertion in his sacred

duties, that darkness has, *per se*, a degree of terror in it, quite apart from associations of any kind, and here there is this strange anomaly, that, instead of fear prompting silence, it should produce garrulity, yet so it is.

The majority of our nocturnal birds are inhabitants of wilds, and the "lonely places of the earth," as if it was intended that their shrieks or wails should not trench upon the rest of creatures located in peopled districts,

"The Bittern's boomings, dissonant and harsh,
Wake only echoes from the dreary marsh;
And nature's ordering hand, for ever kind,
The Owlets' screams has to the woods confined."

This last observation, however, does not universally hold good, for there is not a plough-boy in agricultural places who does not know how sacred the Yellow Owl is held in the farm-yard, by reason of his mousing propensities. It is almost incredible, it is said, how many of the genus *Mus* fall into the clutches of these midnight hunters, and I have myself at dusk seen them watching, cat-like, at the foot of stacks for their prey, though how they are quick enough to catch them then I do not know, as I never saw the feat performed; in flying it is a different matter, of course. Most members of the Owl tribe are fond of the woods, but there is a handsome species which is as often found on commons; this is the Long-eared Owl, of which the hen is really a very large bird when on the wing, and it is probable that small rabbits and leverets are preyed upon by this bird, as well as young game; indeed this is taken for granted by sportsmen, although they would be puzzled to give any proof of the fact. This idea is easily kept up by gamekeepers, who get so much a head for destroying "vermin," and therefore, it is obvious, the more they can swell the number of luckless animals to be included under that general term, the better for them. The talons of this tribe of birds are of a very formidable description, and therefore it is obvious that there must be some use for them, which is hardly to be accounted for if we confine their prey to mice only.

It is a somewhat remarkable circumstance that the plumage of all night-birds should be so very much more downy, as to the quill feathers, that is, than that of day-birds, and Gilbert White and other naturalists assume that the purpose to be answered is the being thus enabled to steal unperceived upon their quarry. But the difficulty is this: are nocturnal animals more active than diurnal? or are nocturnal animals of prey less endowed with activity? I do not know that I can honestly answer either of these questions in the affirmative. Mice are certainly very quick in their movements, but it is in a limited space, and I don't know they are more so than ordinary wild animals. Then again, no doubt, the Owl has a clumsy appearance, chiefly from his large head, (which, by the way, owes much

to the feathers upon it;) and when we ordinarily see him, he looks dull and stupid; but you must remember that we see him under great disadvantages, namely, in the daytime, when his eyes are dazzled, and he is half asleep. But see him at night, as far as you can, and you will confess that he is indeed a different creature, active and full of energy, with the most expressive eye that can be imagined; in fact, his whole being is changed, and there is activity enough for anything. His flight is certainly very noiseless, and it may be that the very stillness of the dark hours makes every sound so distinctly and easily heard that some such provision is necessary. This I look upon as the most probable and true reason why there is this peculiarity, and also that nocturnal animals are generally very quick of hearing, probably from so much more depending upon this sense than can be the case with diurnal animals.

The large Owls, such as the Eagle Owl, seem to prefer open situations, and not only so, but those which partake of a marshy character; but the reason for this does not clearly appear, unless it be that the water-rat is there an attraction, but so it is.

Owls are very generally dispersed through the country, but it is not so with the Nightjar, which is essentially a moor-bird, and, as a general rule, never found in the cultivated districts, except such as abut upon wastes and commons. Having resided in a heathy district during many years of the early part of my life, I had very good opportunities of observing their habits, in which I took a great interest; and in support of my first assertion, my experience goes clearly to the fact that since cultivation has made inroads upon nature's wilds, the numbers of these birds have greatly decreased, and in some parts they have altogether ceased to return in May, as was their former wont.

The tribe *Caprimulgus*, or Goat-sucker, to which this bird belongs, is a very large one, and contains a vast number of varieties, chiefly to be found in America, and some bear a very strong resemblance to the Owl. Others we are familiar with the names of, through Fenimore Cooper, the transatlantic novelist, when he speaks of the note of the "Whip-poor-will," and the valley of the "Wish-ton-wish," both varieties of the Nightjar, if not one and the same bird, which I am not learned enough in American popular ornithology to determine. We know very well the ridiculous superstitions which have attached themselves to this poor creature, traceable back to the dark ages, and even now, I believe, held in some unsophisticated village districts, where old wives and tottering rustic sages shake their heads and predict ill-luck at the appearance of the sprite-like Evechurn, or Puckeridge, as they call it; more especially when there are young calves, or cows likely to become mothers. How hard it is to knock the veriest nonsense out of the heads of superstition and ignorance! It is not so long

since witches were believed in, and antidotes administered. I remember perfectly well hearing a Captain of Horse-guards tell a story, which would now be hardly credible. He was, (now many years since,) quartered, somewhere in the midland counties, upon a blacksmith, who had a sickly son, the said son's weakness being commonly ascribed to the evil influence of a poor old woman in the village, who had the misfortune to be particularly old, ugly, and cross-grained—a not uncommon combination, the last being almost a natural *sequitur* upon the two former. This subject was discussed in the gallant captain's presence, but he could scarcely believe that the matter was treated seriously; but the sequel shewed that it was only too much so. For every evil there is said to be a cure, and in this instance it was considered that the infallible antidote would be that some member of the family should draw blood of the witch! but how was this to be accomplished without the intervention of actual assault and battery? Some ingenious person at last hit upon a device, which, alas! for the poor old crone, was but too successful. She was invited to tea, in the most (apparently) amicable manner, and accommodated with a rush-bottomed chair, where she had hardly "got comfortable," when a youthful scion of the blacksmith race being introduced surreptitiously beneath, with no other weapon than a cobbler's awl, surprised the poor old lady's leg in the most unceremonious manner; the requisite antidote was, as may be imagined, quickly produced, and need I add, the hitherto sickly youth grew up a healthy man; but this last was the blacksmith's version of the matter, when he and the captain accidentally met in after years, and he related to him the above episode, which is so far incomplete that I cannot say whether the poor old woman obtained redress for her injury, or was punished for a witch upon such evidence—the more likely conclusion. If we believe such a thing as this, and I have no reason whatever to doubt that it took place, how can we doubt that a bird, known better by hearsay than by personal knowledge, having its movements involved in obscurity, and being capable of uttering so wonderful a sound for its size, should be invested with more than ordinary qualities.

(To be continued.)

NOTES ON CRUSTACEANS.

BY G. HODGE, ESQ.

ON reading "Notes on Crustaceans," by W, in the October number of "The Naturalist," it brought to mind numerous instances in which I had found Crabs with parasitic growths upon them, those that have come under my notice being *Hyas coarctatus*, a species unusually plentiful on this coast, amongst the rocks towards low-water mark. They are deci-

dedly gregarious, for I invariably find several in one pool, however small that may be. They seem to prefer the dark overhanging rocks containing deep muddy holes, and I have counted as many as eleven and thirteen in such a spot, when the pool has been no larger than an ordinary table.

W seems to incline to the idea that the fragments are first entangled in the hairs, take root, and gradually extend into the shell: now to me this appears a scarcely feasible notion, as it is generally held that these forms of life (*Algæ* and *Zoophytes*) must be regularly developed from spores and ovules. How then can a torn fragment take root and flourish? Those individuals of the Crab kind that have come under my notice, and they have been not a few, have given the preference to *Algæ* of a reddish brown colour, portions of which were nipped off and laid on the back and about the head, a careful examination of large individuals would also shew numerous minute growths springing up. I was much amused at the appearance of a fine large *Hyas*, which was stalking along, with all the majesty which borrowed plumes often produce. It was seen in a large deep pool, round the edge of which abrupt rocks stood out, affording a shelter for some very fine tufts of *Delesseria sanguinea*; well, this individual had established himself amongst the *Delesseria*, but noticing, no doubt, that the colours of his shell was an unpleasing contrast to the handsome weed, he proceeded to array himself with the desired covering; little bits, the tips of the leaves, were accordingly detached and stuck upon the carapace in an extremely irregular manner, giving the crab a most ludicrous appearance; and as I moved to the pool to get a good view, it merely stalked leisurely along, evidently quite safe. It is next to impossible for this delicate plant to grow from such fragments as here described, the tips of leaves.

Now having shewn that the covering is in certain cases mechanically attached, I will endeavour to prove that it is a regular work which the crab performs. My first acquaintance with *Hyas* was a small specimen found during one of my early searchings on the rocks. This, with the other captures, was put into an aquarium, but in four or five days I missed it, and doubted not that like numerous other animals it was dead, and therefore commenced a search, and soon found the remains, which I immediately removed, and instituted a further search to see that nothing else had shared the same fate, when lo! another *Hyas* was there, flapping away with his little brushes, no doubt wondering who I was that thus invaded his domains: now this completely nonplused me, as certain was I that only one had been put into the trough. Being young on the subject of aquaria keeping, I did not at first alight upon the idea that the supposed dead body was merely the cast-off shell; but as this slowly gained possession of me, the luxuriant growth of *Algæ* upon the newly-

cased article rather upset my faith in the idea, as the utter impossibility of a fine tuft of weed half an inch high, springing up in three days, was more than I could fancy. Taking the crab out and carefully examining it, I found the weed was not growing, being merely laid across and cemented in some manner, and on looking at the contents of the aquarium, I saw it had been taken from a large tuft under which I first found it. This weed could only have been nipped off, as there were no floating fragments; and further, the weed could not have been torn off, by the hairs being much too strong and healthy for that. There is a small specimen of the same class in one of my troughs, which has during the last few days varied his covering by a few bits of *Alvæ*, this plant being the principal vegetable part of my stock.

I therefore beg to suggest that although the coverings of many of these crabs are in a healthy state and growing, such growth is not the result of the first mechanical attachment, excepting in an indirect way, as any temporary attachment would eventually decay and die out, not before such secured germs might have escaped from them, and being received on the shell, there form root and flourish; still it is just as likely that those regularly rooted, make their appearance in the same manner as they do on the rocks and stones by purely natural causes, and at the same time it appears to be a wise provision of the Great Creator, that these defenceless creatures should, at their most helpless stage, (when they have just cast their old and hard shell for a new and soft one,) be able to frame a temporary covering and shelter for themselves, until time has elapsed sufficient for the regular growth of a more perfect and lasting one. I may remark that all that I have seen being littoral specimens were covered with *Algæ*, the *Zoophytic* growth appearing only to be found on those from deeper water.

Seaham Harbour, October 9th., 1857.

Entomology.

THE STUDY OF NATURE; AN ENTOMOLOGICAL PRO'EM FOR 1858.

BY THE EDITOR.

THERE are many impulses by which, unknown to ourselves, we become students of Nature. Perhaps the most common is that which springs from an instinctive and earnest love of the good and beautiful in the glorious world around us. It is a morbid and sometimes ill-natured view of the objects of our existence, which endeavours to chill the warm and enthusiastic feelings with

which the Naturalist regards the objects of his study. "The greatest amount of happiness to the greatest number," is the Benthamite dogma upon which philanthropists of modern days found their theories for benefitting mankind. To some, things sensual form the greatest means of being what they call happy. Manly sports, as the excitements of the ring and the turf, have charms for many. The love of money, the stern duties of a life of labour, even the contentions of party, small and great, include the aspirations of vast numbers after the desideratum of life—human happiness.

Turning from the sensual to the intellectual, the field opens still wider, and we make a great lift in the scale. The human mind is after all a wonderful and noble effort of Creative Wisdom. Divest it of its little and pardonable vanities, let it revel in the wide field of thought and reflection, develop its hidden powers, moderate its somewhat too lofty aspirations, and imbue it with the great truth that it is part of a responsible Being; and how glorious a picture can that self-same mind draw of its own position in the scheme of Nature.

Now of all intellectual operations the love of Nature is among the purest and the best. We will not disparage others, as the love of art—of science—of profound study—of oratorical display—of poetry or song—but we say among these, intimately wound up as it is with some of them, we rank not least, the Study of Nature.

It is our business, however, to confine ourselves here to that part of Nature which comprises the "World of Insects." Those gay, transient, often insignificant forms, which live their short day of life and then pass away for ever, leaving behind them records of their habits and instincts: a part of the Great Scheme it is the vocation of the Naturalist to unravel. And let not any one imagine that this is a trifling or a useless study. We have no sympathy with those who shrug their shoulders and cry *cui bono* to a pursuit which they do not understand. All science is useful as a means of education. A knowledge of insects has in addition other claims to our notice. One of the greatest discoveries of modern days—that of the reflex function of the nervous system—was perfected by the dissection of the larva of *Sphinx ligustri* by Newport and Marshall Hall; and many a poor sufferer who is treated with the knowledge which this discovery has added to the science of medicine, has reason to bless those who have thus studied the Physiology of Insects.

Entomology, as a popular pursuit, has the great advantage of being open to all classes of society. The poorest and most uneducated person can rig up a net, stick a piece of cork into a box, and become at once a "Student of Nature." We care nothing about such a one being termed a "mere collector;" his collection makes him happy, and the pursuit expands his mind, and gives him an insight into the beautiful works of Creation. "I am a poor man," writes one of our correspondents, "and have a family to support, which obliges me often to work from four in the morning to eight at night, *after which I go into the woods to sugar for insects.*" Surely the pursuit must have many charms if it can produce effects like this.

We most heartily wish, then, a happy and prosperous New Year to all Entomologists, whether our readers or not; and we will conclude these brief remarks with the following quotation from the author of "Sea-side Studies," in "Blackwood's Magazine" for October last; a writer whom we predict will rank high among the first Naturalists of the present age.

"The Naturalist may be anything, everything. He may yield to the charm of simple observation; he may study the habits and habitats of animals, and moralize on their ways; he may use them as a starting-point of laborious research: he may carry his newly-observed facts into the highest region of speculation; and whether roaming amid the lovely nooks of Nature in quest of varied specimens, or fleeting the quiet hours in observation of his pets; whether he make Natural History an amusement, or both amusement and serious work, it will always afford him exquisite delight. From the school-boy to the philosopher, all grades find in it something admirably suited to their minds. It brings us into closer presence of the great mysteries of life; and, while quickening our sense of the infinite marvels which surround the simplest object, teaches us many and pregnant lessons which may help us through our daily needs."

"And of such truths
Each to itself must be the oracle."

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

PART II.—HETEROCERA.

DIVISION II.—BOMBYCES.

1. *Euchelia Jacobææ*.—Taken in this neighbourhood, but rarely. (B.)
Not uncommon at Woolpit, near Stowmarket, in the larva state. (C.)

2. *Deiopeia pulchella*.—Taken once by Mr. Levett in Finborough Park:
It was brushed out of a fir-tree close to a stream of water. (B.)

A pair were taken a few years since in the garden at Rougham, near Bury, by the gardener of Mr. Edward Bennet, and are in Mr. B.'s collection. (C.)

3. *Lithosia rubricollis*.—Very abundant at Playford. The larva, which is very subject to Ichneumons, may be found from the middle of August till nearly the end of October, though, at this late period, it is nearly sure to be stung. It feeds upon various lichens, having, however, a decided preference to those growing on fir trees. In the "Manual" it is stated that all the species of this genus fly in the evening. *Rubricollis*

is, however, an exception, and the perfect insect may be seen in the noonday sun, swarming round the tops of fir trees with an undulating flight, not unlike that of *H. humuli*, ♂.

4. *L. quadra*.—Not rare at Playford. When at rest the folded wings will at once remind the ivy-hunter of *Vetusta* and *Exoleta*. The larva is very handsome, and feeds upon lichens, preferring, I think, the oak. It may occasionally be seen after windy weather crawling up the trunks of trees; but the best way to obtain it is by beating, and the nearer it is full-grown the better the chance of rearing it: when bred it is a splendid insect, and grows to a large size. I have specimens in my collection measuring two inches and two lines. It is said to be "common" in "Westw. and Humph. British Moths," but I must entirely dissent from this statement.

5. *L. griseola*.—Very abundant: comes to light. The larva is lichenivorous, preferring poplars, but will also eat low-growing plants.

N.B.—I bred this insect July 10th., 1857, from pupa brushed out of oak. (B.)

The larva of this insect will feed freely upon sallow. I bred a pair a year or two since from larvæ entirely fed upon this tree. (C.)

6. *L. stramineola*.—Rare: two at light.

N.B.—I took two specimens at light last summer early in August. (B.)

7. *L. complanula*.—Very abundant: comes freely, alas! too freely, to light. The larva may be found on trunks of poplar, in company with that of *Griseola*. Both may be taken at night with the aid of a lantern.

N.B.—I have bred this insect from a larva fed entirely on crab. The larva of *L. griseola* and *complanula* are very slow in arriving at their full growth; though they are one-fourth grown now, (Nov.), and hibernate, many of them will not be full fed till July. In appearance they closely resemble each other, being both black and hairy, with an orange stripe on the side. In *Griseola* this stripe is paler. (C.)

8. *L. helveola*.—Once at sugar last summer, June 18th. (B.)*

9. *L. aureola*.—Scarce. I used to beat the young larvæ(?) from fir trees in April, at Playford, but could never succeed in breeding them. The "Manual" gives the end of June and July as the period of its appearance in the perfect state; it must, however, often occur much earlier, as I have taken it more than once on the wing as early as the middle of May.

N.B.—Taken at Ringshall, near Stowmarket, by Mr. W. Baker, and at Woolpit, near Bury, by myself. (C.)

10. *L. miniata*.—Not uncommon. From the fact of my having always

* I did not find this insect at sugar myself. It was brought to me by my gardener, whom I had sent to the woods to sugar, and he took it with others. It was doubtless at rest on the tree, and not feeding; just as *C. ligniperda* is sometimes found.—Ed.

beaten the perfect insect from *alders* I am disposed to think that the larva must feed on the lichens of that tree, but I cannot speak positively, having never met with it.

N.B.—I have beaten this insect not unfrequently out of *oak* in Kent. I never saw the larva. (C.)

11. *L. mesomella*.—Not common. (B.)

12. *S. Irrorella*.—Not common. (B.)

I took the larvæ of this insect in great abundance in May, 1856, on the Hampshire coast. They are black, very hairy, and marked with yellow. They were feeding upon the ground lichens, about two hundred yards from the tide mark. I took them home, and having cut a sod, placed it in an earthenware pan, upon this I placed a quantity of lichen, and having turned in the larvæ, tied some gauze over the pan, and kept it as much as possible in the sun. As I was residing some miles from the sea, I was obliged to feed the larvæ with tree instead of ground lichens, but they did not seem to mind the change. I used to sprinkle the lichen with water nearly every morning. I reared a fine series of the perfect insect. In the wild state the larva, when full fed, crawls under loose stones or oyster shells, where it spins a very slight web, and turns to pupa. The perfect insect appears in June and July. (C.)

13. *Nudaria senex*.—Very rare. (B.)

14. *N. munda*.—Common, (B.)

15. *Callimorpha dominula*.—Rare. I met with a few larvæ last March, crawling about in the sunshine on Kesgrave Heath, but did not succeed in breeding them.

16. *Euthemonia plantaginis*.—Not uncommon in woods near Ipswich. (B.)

Some few years since, when at a private tutor's, at Matlock, I used to take the larva of this insect on the limestone hills in May. It is very fond of sunning itself. It feeds on *Poterium sanguisorba*, (L.) *Helianthemum vulgare*, (L.) and other low plants. It may easily be recognised by its half-red and half-black appearance. It feeds up half grown in the autumn, and hybernates. (C.)

17. *Arctia villica*.—The same remarks are applicable to this species as to *C. dominula*.

N.B.—Has been taken at Creting and Barham, near Stowmarket, by Mr. W. Baker. (C.)

18. *A. caja*.—Abundant of course in the larva state. Mr. Crewe and I made some experiments this summer upon this insect, namely, trying to breed some varieties by forcing the larvæ to eat some strong coloured flower, and not allowing them to touch anything else. What his success was I do not know: I failed entirely; I gave my larvæ wallflowers.

19. *Phragmatobia fuliginosa*.—Very abundant in larva state, feeding upon yarrow in September and October. It hybernates; it does not, however, feed in the spring, at least mine did not; I kept them in a box covered with a wire lid; at the bottom was a sod of earth, and on it I placed

five or six handfuls of loose moss. I left them in the open air, but did not expose them to rain. They spin up about the beginning of March, but do not turn to pupæ for a fortnight or three weeks. One of my pupæ produced a fine Hermaphrodite.

N.B.—I took a larva this day, Nov. 10th., snugly ensconced under the bark of a willow tree. (B.)

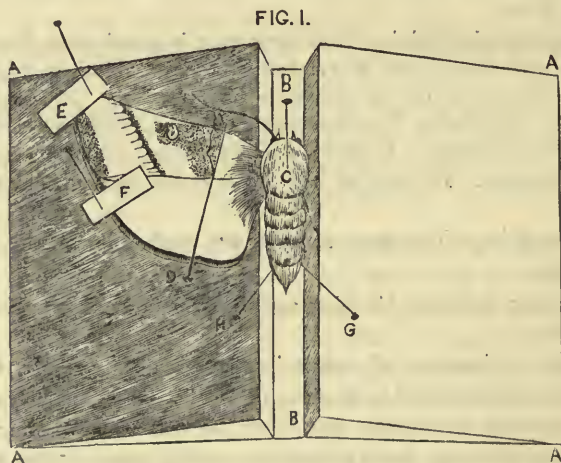
I am sure that this insect sometimes passes the winter in the pupa as well as the larva state, as I have taken it flying on a bright sunny day in March. The larva is polyphagous on low plants. (C.)

(To be continued.)

HOW TO SET LEPIDOPTERA.

BY THE REV. J. GREENE, M.A.

It will readily be granted that an insect, however fine its condition may be, loses much, both of its beauty and value, when badly set. To set an insect *well* is not an easy matter, and requires a considerable amount of patience and skill. There are three methods in general use, which I may mention—the flat, the rounded, and the sloping. The first of these prevails generally on the continent, but meets (in my opinion deservedly) with little favour in England. The second may, I think, be



termed the metropolitan method, being, as far as my experience goes, almost confined to the London entomologists. The third is the plan adopted by a large number of the country collectors, and is the one I employ myself. But there are, unfortunately, not a few who employ a method of their own. The following is the recipe:—

"Take the largest pin you can find, if with a gigantic head so much the better; thrust it hap-hazard into the body of the insect, then pin it to a piece of cork, push up the right-hand wing half an inch, the left a quarter ditto; the abdomen may turn either to the right or left, and the antennæ should stretch out straight from the head, or lie above or below the insect."

Now assuming for the moment, that this plan, however *simple*, is anything but pleasing to the eye, I venture to suggest to the inexperienced, as the result of many years trial, the following method, requesting them at the same time to bear in mind that I do not assert it to be the *best*—only *better* than that which they have been in the habit of adopting.

Get a board of soft deal, (fig. 1, A A A A,) a foot or somewhat more in length, and about three inches in breadth. In the middle make a groove, B B, one third of an inch in depth, and a quarter of an inch in breadth. Glue a thin layer of cork on the bottom of the groove. Commencing then at the edge of the groove, plane each side of the



board until it assumes the form in figure 2, taking the greatest care that each side exactly corresponds.* Suppose now you have a specimen, say of *L. turca*; hold it underneath with the fore-finger and thumb, *pressing up* the wings, until their apices nearly touch; then take the pin, insert it exactly in the centre of the thorax, (C,) the head of the pin sloping slightly forwards towards the *head* of the insect. The point of the pin should emerge at the juncture of the legs. The pin should be clear of the moth on the under side, at least one fifth of an inch: fix the moth now in the groove. There should be a *slight space between the moth and each side of the groove*. Push in the pin until the wings are *nearly*, not quite level with the board. Then move up the fore wing to the required height, and having a little slip of paper on the moistened tip of the middle finger of the left hand, hold the wing with it by the apex in this position; then take in the other hand a pin, (D,) and insert it in the board, as in the figure, and press it *gently* down till it holds the wing firm. Pursue the same method with the other side. By this means

* If preferred, the board may be *rounded*, as in figure 3.

you will see whether the wings are the same height, a condition inseparable from good setting.

When this is arranged to your satisfaction, take a slip of stiff paper, (E,) and pin it on the apex of the wing, as in the figure. Remove now pin D, and having pushed up the under wing, fasten it by slip F. In order that the abdomen may be in its proper position, fix it, as in the figure, with the two pins, G and H. The antennæ should also be arranged with pins: this being done the operation is accomplished, and the insect should be left there for from ten days to three weeks. However intricate this "modus operandi" may appear in the *description*, it is in reality very simple after a little experience; and, aided by the figures, I trust my readers will find it so, should they feel disposed to adopt it. I need scarcely remark that the boards and grooves must vary in size according to the insects; but having once settled the amount of *slope* it should be alike in all.

Entomological pins may be obtained of Edelsten and Williams, Iron Works, Birmingham, who will, upon application, forward a list of prices, etc. The sizes I use are as follow:—For the large *Sphingidæ* and *Bombyces*, 11 and 12; for the *Rhopalocera*, middle-sized *Sphingidæ*, *Bombyces*, *Noctuæ* and large *Geometræ*, 8; for middle-sized *Pyrales* and *Geometræ*, 7; and for the small species of all orders, 10.*

Should these remarks prove of any service to the readers of "The Naturalist," I shall be happy, if spared, to forward occasional similar notices as to catching, killing, etc.

32, Lower Pembroke Street, Dublin.

A LIST OF THE RARER SPECIES OF COLEOPTERA, WHICH OCCUR, OR HAVE BEEN TAKEN IN THE NEIGHBOURHOOD OF HARLESTON, NORFOLK.

BY J. LEEDES FOX, ESQ.

AND IN THE NEIGHBOURHOOD OF BUNGAY.†

BY W. GARNES, ESQ.

[When no initial is affixed the insect has been recorded by each of the above gentlemen. The initials F and G respectively intimate that it has been observed only by the person to whom the said initial refers.]

Carabus clathratus.—Once by my father, a few years ago, close to the town, and is now in our collection. (G.)

* Nos. 5 and 15 are also most useful sizes.—Ed.

† Bungay is situated in the north of Suffolk. Harleston is just in the borders of Norfolk, about seven miles west of Bungay. The latter town is about twelve miles from Lowestoft.—Ed.

Culosoma sycophanta.—I have one specimen that was found at Lowestoft. (G.)

Nebria livida.—At Dunwich this year. (G.)

Panagæus crux-major.—Several a few years ago in a flood. (G.)

Anchomenus sexpunctatus.—Once in a flood. (F.) Plentifully some years ago by the late Mr. Cooper, in Sexton Wood. (G.)

Lelia chlorocephala.—Occasionally. (F.)

Oödes helopioides.—Rare in floods.

Pterostichus picimanus.—I took two specimens in a flood about four years ago. (F.)

P. anthracinus.—Frequent in marshes in spring. (F.)

P. ruficollis.—I once took a specimen at St. Margaret's. (F.)

Amara spinifer.—Frequent in autumn. (F.) Occasionally. (G.)

Harpalus sabulicola.—Very rare. (G.)

H. punctatulus.—Rare. (F.)

H. serripes.—Occasionally in gravel-pits. (F.)

Trechus discus.—One specimen some years ago. (F.)

Bembidium rufescens.—Very rare.

Agabus agilis.—Very rare. (G.)

Hydroporus Davisii.—Very rare. (G.) Occasionally. (F.)

H. punctatus.—Frequent. (F.)

H. picipes.—Very rare. (G.)

H. vittula.—Occasionally. (G.)

H. memnonius.—Occasionally. (G.)

H. Gyllenhalii.—Not uncommon in one pond near Bungay, in the winter and early spring months. (G.)

Haliphus obliquus.—Frequent. (F.)

H. elevatus.—Occasionally. (G.)

H. mucronatus.—I took this insect once, in May, 1856, in a ditch on Bungay Common. (G.)

H. confinis.—Occasionally. (G.)

Cnemidotus cæsus.—Rare. (G.) Occasionally. (F.)

Pælobius Hermannii.—Frequent. (F.)

Colymbetes bistriatus.—Rare. (F.)

C. vitreus.—Rare. (F.)

Dytichus punctulatus.—Frequent. (F.)

Parnus auriculatus.—Very rare. (G.)

Elmis variabilis and *E. lacustris*.—Not uncommon. (G.)

The Rev. Hamlet Clark, in speaking of these two insects in the "Zoologist," for April, 1856, says, "It is to be noticed, that while *E. variabilis* is taken only or principally in the northern counties, *E. lacustris* has its metropolis in the southern." I find them together in the same

stream, under the same stones, and on the same plants. (G.)

Elmis cupreus.—Occasionally. (G.)

Helophorus dorsalis.—I took this insect once this year, (1857.) (G.)

Hydrochus elongatus.—Frequent. (F.)

Oiceoptema dispar.—Very rare. (G.)

Silpha tristis.—Very rare. (G.)

Enicocerus viridieneus.—Frequent. (F.)

Berosus æriceps.—Occasionally in early spring in a pond at Weybread. (F.)

Phalacrus carices.—Sometimes abundant. (F.)

Necrophorus sepultor.—Occasionally. (F.)

Nitidule variegatæ.—In blossoms of *Oxyanthus crategi*. (F.)

Strongylus imperialis.—Rare. (F.)

Campta lutea.—Frequent. (F.)

Micropeplus porentus.—Frequent. (F.)

M. staphylinioides.—I once took this species under some fir trees. (F.)

Triphyllus punctatus.—Occasionally in fungi in December.

Tetratoma ancora.—Once by my father. (G.)

(To be continued.)

A LIST OF THE INSECTS OBSERVED IN THE SOUTHERN PART OF THE COUNTY OF SUSSEX.

BY W. C. UNWIN, LEWES.

IN submitting to the readers of "The Naturalist" the following list of some of the Insects of the different orders, observed on the chalk range of the county of Sussex, within a limited district, I would briefly remark it has no pretensions to perfection, as doubtless many species still remain to be added to it; but all that are here noted are from personal observations, or from those of my friends, on whose accuracy I can rely. It is intended the list in its continuation should embrace portions of the other orders, and it is hoped it will be a means of affording some degree of interest to those who delight in the same pursuit. To entomologists of a higher rank it will appear but a trivial effort towards the advancement of science, being, as it is, the result of a collector's notes: but a good collector must necessarily be a tolerably good observer. I will commence with the order *Diptera*.

FAMILY SYRPHIDÆ.*

* The student in Entomology will find ample details of this interesting family of insects in "Insecta Britannica—Diptera." Vol. I. By Mr. Walker. And also a shorter notice in Dallas's "Elements of Entomology," just finished. The family is divided into thirty-one genera, (British,) and the species are familiar to all those who have observed the small bee-like insect, hovering over the flowers in gardens or woods from spring to autumn.—ED.

Eristalis tenax.—A very common species, and usually appears on the first warm days of March; probably, like some of the Lepidoptera, is called forth from its winter hibernation by the genial warmth of spring. It is an insect of successive occurrence throughout all the summer months, even until late in autumn, being one of the few insects which may be seen on the blossoms of the ivy on a bright October day.

Var. *Campestris*.—This variety is very common.

E. aeneus.—I have taken this species off the flowers of *Senecio Jacobæa*, (common ragwort,) at Pevensey, on the shingle, and also in a lane near Kingston, Lewes, in August, but not common.

E. similis.—Of very frequent occurrence throughout the summer; habits similar to *tenax*.

E. intricarius.—Not common, but observed on the blossom of the blackthorn, (*Prunus spinosa*,) in April and May, near Landport and Iford, near Lewes.

E. nemorum.—In the Plashet Wood in June and July, on umbelliferous plants.

E. arbustorum.—Abundant everywhere throughout the summer months. The male and female present such a very different appearance that the young collector might readily mistake them for separate species.

E. horticola.—In Plashet and Warringore Woods. Rare.

Helophilus pendulus.—In Plashet Wood and the lanes in the neighbourhood of Lewes and Hailsham, from early spring throughout the summer. Varies much in size.

H. lineatus.—Very rare. One specimen only, taken in a wood near Firle.

Syritta pipiens.—Most abundant. An active lively little insect, and one that may be observed on almost every roadside or garden flower throughout the summer.

Xylota sylvanum.—Not common, and chiefly to be found in the lanes near to woods—the Plashet and Warringore Woods. A very shy insect.

X. segnis.—Found in the same localities as the preceding, but rarely.

Criorhina oryacanthæ.—In the Plashet Wood on warm days of March I have observed it tolerably common, settling before me on the pathways in the bright sunshine; it is apparently a rather bold species, similar in its habits to *Sarcophaga carnaria*.

Volucella pellucens.—Taken, but rarely, in the Plashet Wood in July and August, basking in the hottest sunshine upon the leaves of trees and plants. It is a very beautiful species.

V. inflata.—Equally as rare as the preceding, and equally as handsome. It frequents the same localities in June and July.

V. bombylans.—Common in August, and usually found at rest on the flowers of the knapweed, (*Centaurea scabiosa*,) on the borders of corn-fields at the foot of the Downs. It is very sluggish, allowing itself to be taken with the fingers. It has a very bee-like appearance.

Chrysotoxum intermedium.—Rare. I captured two specimens on July 23rd., 1854, in the Plashet Wood.

C. marginatum.—Rare. In a moist wood near Firle, in July, 1855. This

with *intermedium*, is a very prettily marked species.

Pipiza noctiluca.—Taken off the leaves of hazel in a lane near Landport, near Lewes, in June. Occasionally.

P. notata.—Two specimens from the blossoms of the common blackberry by the roadside near the Spittal, Lewes.

P. virens.—Found near Landport in the flowers of *Ranunculus acris*, in June, 1854. Individual species of this genus do not appear to be very common.

Chrysogaster chalybeata.—Rare. I have observed, or rather captured, two specimens from the flowers of ranunculi. The flowers of the ranunculi, and also those of the dandelion, appear to be especial favourites with the *Diptera*.

C. viduata.—Not uncommon in June and July in the neighbourhood, on the flowers of *Ranunculus acris* and *bulbosus*.

C. metallica.—Same habits as the last, and, no doubt, frequently confounded with it. A difficult genus to determine.

Brachyopa bicolor.—Of frequent occurrence generally. I have observed it in several localities in the neighbourhood in May and June.

Rhingia rostrata.—Very common and generally distributed in this locality, visiting the blossoms of the hawthorn in May and June; it continues to be found all the summer months, and is then attracted by the flowers of the different species of *Cardui*. It is a very pretty species, and one which may be easily known.

(To be continued.)

Miscellaneous Notices.

Carnivorous Propensity of the Hedgehog.—When shooting in the preserves of Sir Brydges Henniker, near Dunmow, the beginning of the present month, I saw among the "vermin" a long row of Hedgehogs. I asked the keeper what his object was in exterminating this, in my opinion, harmless animal. He answered, "It sucks eggs, and I once saw it kill a Leveret." On further enquiry, he stated that this took place when he was in the service of a gentleman in Norfolk, who was present and saw it done. The young have been tamed and turned down in the garden. Should this meet the eye of the gentleman referred to, I should be much obliged if he will confirm or deny the story.—C. R. BREE, Stricklands, Stowmarket, October 15th., 1857.

[It is well known that the Hedgehog is, on occasion, carnivorous.—F. O. MORRIS.]

Mildness of the Early Winter of 1857.—"As a proof," to use the stereotyped phrase, "of the extraordinary mildness of the season," I have to mention, in addition to other instances from Lincolnshire and elsewhere, that here we have at the date of "these presents," in our garden, sweet-peas, fuchsias, and violets in bloom and bud; and until within the last

week or so, the elms at Kilnwick Percy, Londesborough, and other parts of the country, were almost as perfectly green as in the height of summer. Last Saturday, the 21st., I heard the Thrush singing in a wood near the first-named place, and gathered three mushrooms in the field by its side. There is no appearance of any change yet, so that we may again have, as I saw some years ago, and recorded the fact at the time in the "Zoologist," the fuchsia in blossom in Christmas week near Malton, eighteen miles north-east of York. I hear that it has been very cold in the south in Berkshire and Cambridgeshire, but here we have had nothing but mild fine weather with occasional fogs.—F. O. MORRIS, Nunburnholme Rectory, November 24th., 1857.

P. S.—27th.—On the 25th. we dined, from choice, with the window wide open, and several times the fires have been forgotten, and let go out. To-day is a lovely, warm, nay hot, sunshiny day, "as mild as midsummer."—F. O. M.

"Beautiful ripe strawberries were gathered on Wednesday last, (25th. of November,) in the garden of Fred. Glenton, Esq., at Redcar, (the extreme north-east point of Yorkshire, and on the sea coast.)"—*Yorkshire Gazette*, November 28th., 1857.

A Winter Visitor.—A fine specimen of the Butcher Bird, (*Lanius excubitor*,) was shot last week at Twecher, near Kirkintilloch, by John Duncan. When shot it was engaged at dinner on a mouse, which, according to its usual custom, it had stuck on the point of a thorn in a hedge, to enable it to tear it more easily to pieces. The above expressive name has been given to this bird from its suspending its prey before devouring it. It is an inhabitant of the northern parts of Europe, and is seldom seen in this district.—*Glasgow Bulletin*, December, 1st., 1857.

REVIEW.

The Natural History Review. No. I., January, 1857. London: HIGHLEY, Fleet Street. Edinburgh: JOHNSTONE AND HUNTER. Dublin: HODGES AND SMITH.

This number contains the following Reviews:—

Review 1.—"Synopsis of the British Diatomaceæ." Vol. II. By W. Smith, F.L.S. 2.—"Elements of Entomology." By W. S. Dallas, F.L.S. 3.—"Ornithological Synonyms." By H. E. Strickland, F.G.S. 4.—"General Outline of the Animal Kingdom." Second edition. By T. R. Jones, F.R.S. 5.—"Entomologist's Annual for 1857." By H. T. Stainton. 6.—"Typical Forms and Special Ends in Creation." By Rev. J. M'Cosh, L.L.D., and George Dickie, M.D. 7.—"Elementary Course of Geology,

etc." Second edition. By Professor D. F. Ansted. 8.—"Miscellaneous Notices." 9.—"Austrian Fauna—Coleoptera." By L. Redtenbasher. 10.—"French Fauna—Coleoptera." By M. M. Fairmaire, and Laboulbene. 11.—"Insects of Germany—Coleoptera." By Dr. Herman Schaum, and Mr. G. Kraatz. 12.—"Works on General Zoology," New English Translations. 13.—"Manual of British Botany." By Charles C. Babington, F.R.S. 14.—"Glaucus; or, The Wonders of the Shore." Third edition. By Charles Kingsley, F.S.A.

Also nine original communications made to various societies, and thirty notices of serials.

Exchange.

No doubt there are many of your correspondents, and readers of "The Naturalist," who take an interest in Conchology. I should be glad to afford information and lists to any such respecting the shells of this coast and district, and also to make exchanges of Marine, Land, and Fresh-water shells, as mutual accommodation in exchanging is a means of acquiring a complete collection, especially to inland subscribers. "The Naturalist" offers a medium of communication on the subject; being a subscriber, I venture to avail myself of it.—CHARLES H. BROWN, Southport, Lancashire, October 20th., 1857.

Proceedings of Societies.

Thirsk Natural History Society.—On Monday, November 2nd., was held the fifth annual meeting of this Society, Mr. J. G. Baker in the chair. The officers for the past year brought in their reports, were thanked for their services, and re-elected as follows:—President, Mr. J. G. Baker; Secretary, Mr. R. D. Carter; Librarian, Mr. J. J. Packer.

Mr J. G. Baker said, that by reason of the sale of its herbaria, and other causes, the exchanges of British plants, which had been carried on for so many years with eminent utility by the London Botanical Society, were at present suspended, and that in consequence there was now no convenient centre to which collectors might send their duplicates to receive desiderata in return. Whilst this position of affairs continued, he suggested that the Thirsk Natural History Society might profitably lend its endeavours to fill up the vacaney; and he volunteered, if this idea met with the approbation of the members, to undertake the management of the distribution of flowering plants and ferns.

Mr. J. H. Davies expressed his approbation of the idea, and a wish that mosses should be included in the scheme. After some discussion of

their details, the following resolutions, which were proposed by Mr. G. R. Baker, and seconded by Mr. J. Rhodes, were adopted unanimously.

I.—That pending the abeyance of the Botanical Society of London, this Society establish a club for the interchange of dried specimens of British Plants, especially of the higher orders, the management of which shall be vested in two Curators and the Secretary.

II.—That in order to further the carrying into effect of the previous resolution, the Society agrees to admit Corresponding or Non-proprietary Members at the ordinary rate of subscription, (viz., six shillings per annum,) remitting in their favour the customary entrance fee.

III.—That to such of its Corresponding or Proprietary Members as are engaged in the formation of their herbaria of flowering plants or ferns, the Society will undertake to furnish a selection of desiderata in return for a supply of specimens of such species as it requires; and that to such of them as need assistance in naming their specimens, and to such as wish to exchange mosses, it will be prepared to lend such help as lies in its power.

Mr. J. G. Baker was appointed Curator for flowering plants and ferns, and Mr. J. H. Davies for mosses.

Mr. H. Ibbotson exhibited specimens of *Leucobrium glaucum* in fruit, and *Dicranodontium longirostre*, collected by Spruce in the Pyrenees.

The managers of the club have issued the following circular:—

BOTANICAL EXCHANGE CLUB.

Information and Instruction to Contributors.

I.—It is required that the specimens contributed shall have been dried carefully, and that without exceeding the size of half a sheet of demy, they furnish as complete illustrations of the species they represent as circumstances will admit.

II.—To each specimen sent for exchange must be fastened a written or printed label, furnishing the following items of information, namely, 1st., the number and name of the plant, with the authority for the latter, as given in the latest edition of the London Catalogue, or if a moss, in the *Bryologia Britannica*; 2nd., the locality, county, and date; 3rd., the name of the collector and contributor.

III.—In furnishing lists of desiderata, it is requested that the London Catalogue and *Bryologia Britannica* be followed as standards of nomenclature and arrangement.

IV.—It is proposed to send out the return packets as early in the year as practicable, beginning with 1858; and to distribute each spring a report of the operations of the Club, and a list of its desiderata.

John G. Baker, and John H. Davies, Curators; Richard D. Carter, Secretary.

The Querist.

IN "The Naturalist" for November, I noticed your query with regard to the autumnal tone of the Rook. I, too, have been struck with the peculiarity of that tone, and have stated my impression of it in a little poem entitled "Frank Sylvan." I send you along with this the volume in which the poem is published; and I beg you will do me the honour and kindness to accept it with my best wishes. I have just read the sixth volume of your "History of British Birds," and I cannot refrain from expressing to you my admiration of the masterly manner in which you have completed your charming work.—THOMAS AIRD, Dumfries, November 18th., 1857.

The following is the passage referred to, and a good passage it is, as is another on the flight of the Cusbat, on the following page.

"Has not the Rook a harvest cry? a slight
Percussive breathing through her usual note;
A chuckle? that's too strong; well call it then'
The halitus of a spirit crowding through
Her feeble voice, like thanks for God's good corn.
Is this a fancy, or is this a fact?"



F. O. MORRIS.

I think you quite right about the notes of birds. The seasonal variations in the case of the Rook are very discernible.—R. P. ALINGTON, Swinhope Rectory, November 27th., 1857.

The Cockchaffer, (*Melolontha vulgaris*.)—On the 17th. of November last, a workman was removing the earth heaped on the side of a gravel-pit I had opened here, for the purpose of excavating further, and under the soil, and on the grass on the former surface, he found two specimens of the common Cockchaffer alive. I never before knew this insect alive except in the height of summer. Was it an early or late hatch from the chrysalis? Had they lain there since they first came out, or had they burrowed in there since? And is it a usual or even an unusual circumstance for these insects to go under ground for the winter?—F. O. MORRIS, Nunburnholme Rectory, December 14th., 1857.

Animalcules.—For some time past I have observed in a brook in this neighbourhood, patches of *Animalcules*, of a blood colour, on the surface of the mud. On examining some of the mud into which they sink upon being touched, I found it to contain reddish worms, of about the thickness of a pin, and three-quarters of an inch in length. Could any of the readers of "The Naturalist" favour me with the name of them, and also any other information respecting them.—HENRY BUCKLEY, Calthorpe Street, Birmingham, November 25th., 1857.

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TO EGG COLLECTORS.

MR. J. C. STEVENS will Sell by Auction, at his Rooms, 38, King Street, Covent Garden, London, W.C., on TUESDAY, the 9th. FEBRUARY, 1858, a COLLECTION of *rare and well-authenticated* Eggs, formed in ALGERIA last summer, by the REV. H. B. TRISTRAM; including those of the Griffon and Egyptian Vultures, Golden and Spotted Eagles, Orange-legged Hobby, Kite, Little Owl, Chough, *Great Spotted Cuckoo*, Bee-eater, Roller, Thrush-like, Savi's, Rufous, Sedge, and Orphean Warblers, Crested and Short-toed Larks, Barbary Partridge, *Andalusian Quail*, Houbara and Little Bustards, Pratineole, Little Egret, Buff-backed and Squacco Herons, Glossy Ibis, Baillon's Crake, Stilt, Avocet, Whiskered and Gull-billed Terns, Ruddy Shieldrake, Gadwall, White-eyed and Red-crested Whistling Ducks, &c., &c.

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WITH OCCASIONAL ENGRAVINGS.

CONDUCTED BY

THE REV. F. O. MORRIS, B.A.,

Member of the Ashmolean Society, etc.

THE ENTOMOLOGICAL DEPARTMENT

BY C. R. BREE, ESQ.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

LONDON:

GROOMBRIDGE AND SONS, 5, PATERNOSTER ROW.

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NOTICES TO CORRESPONDENTS.

Communications have been received by the Rev. F. O. MORRIS, from Messrs. O. S. ROUND, (four;—T. SOUTHWELL;—S. CLOGG;—W. M. F;—W. G. GIBSON; (two;—J. BROWN;—J. G. BAKER.

Communications, Drawings, Advertisements, Books for Review and Parcels, to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York.

ENTOMOLOGY.

Communications have been received from Messrs. SEALY; UNWIN; REV. H. H. CREWE, (two;) REV. J. GREENE, (two;) J. PORTER, JUN.

We regret that we had not room last month for Mr. Doubleday's communication, and the reports of the Cambridge Entomological, and Nottingham Natural History Societies. We shall always be glad to give publicity to the proceedings of Societies, but they must be sent before the 15th. of the month. By a mistake the above were advertised to appear in the January number.

We must positively decline to insert Mr. Gardner's very "innocent" communication

Want of space obliges us to postpone the second part of "Rare Suffolk Coleoptera" until next month.

* * All communications on Entomology intended for insertion in this department of "The Naturalist," must be sent before the 15th. of the month to C. R. BREE, Esq., *Stowmarket Suffolk*.

TO ADVERTISERS.

Advertisements are inserted on the Cover of THE NATURALIST, on the following Terms:— $\frac{1}{8}$ of a page, 4s.— $\frac{1}{4}$ of a page, 7s.— $\frac{1}{2}$ of a page, 12s.—Whole page, 21s. Bills stitched in, 20s.

Advertisements to be sent in not later than the 15th. of the Month.

A WORD ABOUT MICE.

BY O. S. ROUND, ESQ.



OUR lady readers will not, I fear, think this a very pretty subject, and some, and perhaps not a few, will associate it in their minds with some degree of nervous terror; but I must say that I think, however common this feeling may be, it arises and is perpetuated in great error, which a very little reflection, and a more intimate knowledge of the poor little object of it, will immediately dispel. Only consider your bulk in proportion to a Mouse; it is too ridiculous an idea to admit of a comparison. It may be said so is a wasp; but even a noxious insect seldom attacks, and a Mouse never; nay, it is the emblem of timidity, and did we but reflect upon the real terror which we inspire, and how their little hearts beat at the sight of, to them, so really monstrous an animal as ourselves, we should directly see the utter irrationality of our feeling. I believe that nurses and ignorant people, with whom children are necessarily brought much in contact, originate and foster this mistake, but I am sure it needs but little reasoning to shew how great a one it is. Only look calmly at one of these little creatures, as he steals forth warily from his hole to pick up a crumb which we may chance to have dropped, observe his elegant shape and proportions, the gentle curve of his back, his delicate legs and ears, his bright eyes, and agility and grace of movement, and you cannot fail to be struck by them. Then regard him as a beautiful work of the Creator; consider that his conformation is in all respects, as far as natural wants and qualifications are concerned, the same as our own, only that in agility and in natural grace he is far our superior; indeed it is, like all God's works, beautiful in its adaptation to its wants and necessities to the place it is destined to fill in the scale of creation.

Upon the question of the necessity that exists, or is thought to exist, for their destruction, I will not enter. They have many enemies, the cat, above all, being so common a domestic animal as to insure the supply being equal to the demand, and being always sufficient to scare them from intrusiveness, if she does not make them her prey; but this is a part of that wonderful scheme which we cannot fathom. In our country there are six distinct species—the Common Mouse, or *Mus domesticus*, the Long-tailed Field Mouse, or *Mus campestris*, the Short-tailed Field Mouse, or *Mus pratensis*, the Mower's Mouse, (*Mus messorius*), and the two Shrews, the common one, (*Sorex araneus*), and the Water Shrew, (*Sorex fodiens*;) besides, the following have been considered distinct species:—The Black Short-tailed Field Mouse, otherwise the Black Water Vole, (*Arvicola ater*), the Oared Shrew, (*Sorex remifer*), and the Water Vole, (*Arvicola am-*

phibius.) These last differ chiefly in size, and the Black Water Vole is certainly much less than the Short-tailed Field or Grass Mouse, to which it bears in form and habits so striking a resemblance.

The Common Mouse it would almost seem a work of supererogation to describe particularly, most of my readers being very well acquainted with him, as he is a great lover of domestication, and is seldom or never found in the fields, but prefers the shelter of houses, and the ample supply of farinaceous food which the barns and granaries and stacks of farms supply him with. Here the owl is as much his enemy as the cat, and it is very entertaining to see one of these wisc-looking gentlemen in the dusk of the evening sitting motionless near the bottom of a eorn-stack watching for his prey; and I dare say my readers have often observed the small hole at the barn end, which is purposely made for his ingress and egress.

Mice occasionally are fond of literature, and a hoard of old papers laid up for years without being disturbed, will be often found to be the nursery of a brood of these creatures, who have shredded up the sheets to form a soft bed for the scions of the race of *Mus*. When I was a boy, I have sat for hours together watching these pretty creatures, to see how they sat on their hinder legs, when by chance a real prize, in the shape of a whole uncaten oat, was found, and with what dexterity they chaffed off the husk, which fell in a tiny shower around them, and then on the least alarm how they disappeared with the rapidity of thought; but withal they are not good runners neither; take them on to a large surface, without the advantage of corners and appliances of concealment, and they are what is vulgarly called "done;" they make a poor show, and gallop along very helplessly; in fact, they are much like anything else *out* of its element. Mice are very prolific, and the young are blind and hairless for some days after they are born, and the male is darker and smaller than the female, and this holds good of all the other kinds.

The next kind we come to is the Long-tailed Field Mouse. This is a very pretty creature, larger than the Common Mouse, and of a fine sandy brown, with large, fine, dark eyes, and a white under part. He it is who commits such depredations in the crocus and pea-beds, and who is, perhaps, the handsomest of the whole race. The fields are his home, and those who have lived in the country know how often the ploughman dislodges him from his hole in the fallow. Schoolboys too well know how these little fellows make a famous team of miniature coach-horses, harnessed with thread like the "set out" of the famous Cinderella.

We next come to the Short-tailed Field Mouse, who is certainly not so handsome a gentleman, although his mode of life is curious enough. His head is large, and his nose blunt, and his fur blucish, with red brown extremities. His retreat is in the pasture, hence his name of "*pratensis*,"

or "of the meadow;" and here, under a canopy, to him, of vast and complex herbage, he makes arcades in all directions, but all centring in an underground retreat; and I have observed that he adapts himself to circumstances in the formation of his nest, namely, that where the grass is long and undisturbed, he usually places his "cradle of the young" on the ground, but where the grass is short and more or less fed, it is underground, although he does not by choice fix upon a fed pasture.

We now come to the Shrews, and these are very elegant little creatures, and familiar to every one, as cats kill, but will not eat them, and thus they are constantly found dead in our paths. The fur is most beautiful, and much partakes of the character of that of the Mole, which keeps a soft surface in any direction. These little creatures it is which we hear like grasshoppers chirping in the herbage near us, so shrill is the sibilous sound from their tiny throats. The Water Shrew is larger than the common one, and, I think, somewhat lighter in colour; he is strictly amphibious, and swims and dives with the greatest facility; his nose is also prolonged more than that of his congener, and partakes very much of the character of a snout.

Last, and although least in one sense, not in another, we come to the Mower's Mouse, a species which, until the year 1767, was, as far as is known, unnoticed by naturalists. In that year Gilbert White, the Selborne historian, in a letter to Thomas Pennant, first brought them into notice, although we must suppose, as they are merely locally uncommon, they were always known to villagers and others, whose occupation took them into the fields so much. They are something like the Shrew in shape, but generally smaller, and much lighter and redder. Their nest is about the size of a cricket-ball, and usually suspended about three or four inches above the ground, and fastened, or rather woven, around the stalks of the surrounding corn. Into this "procreant cradle" there is apparently no entrance, but the mother of the little ones, who are nestled so warmly within, has some mode of getting in and out, although it be hid from human sight. These little animals are very tame, and I have seen them feed from the hand readily when in a state of domestication.

There are varieties of almost all the different species, albinos or white Mice, grey and black, but in all the chief characteristics are very distinct; and let us never forget that these little creatures are only one out of unnumbered genera of living beings, formed by the same hand which has "done all things well."

Pembroke Square, Kensington, December, 1857.

CHARACTERISTICS OF COMMON BIRDS.

BY O. S. ROUND, ESQ.

(Continued from page 7.)

THE wings and tail of the Nightjar are very large for his size, and he has a flapping way of flying, which gives the idea of a certain degree of stupidity or helplessness; but this is a mistake, for it arises, I am convinced, from the ease with which he flies, and partly, perhaps, the hour at which we see him, for it must be still light, and therefore he has by no means awoken from his day's slumbers, for there can be no doubt that his powers of flight are very great, of which any one on a light night who will take the trouble to watch him may be soon convinced. It is very common to hear him called ugly, by reason of his large mouth and eyes, but when he is really awake and alert, he does not deserve this character, for instead of nodding head and half-closed eyes, he sits erect, constantly looking round after prey, after which he dashes away like an arrow. His colours are certainly unobtrusive, and well suited to his habits, for the resemblance which he exhibits to the grey stones and moss among which he sits is very extraordinary, and in the day-time you may stumble upon him almost before he will rise, but he does not fly far, unless roused again, and then merely skims away beyond reach. The cock and hen are very similar in general appearance, but his wings and tail are garnished with white spots at the ends of the outermost feathers, which shew very prettily when he is on the wing; in the hen bird these spots are ochre-coloured. Generally speaking, the Nightjar flies low, and will sit on gravel paths watching for prey, rising, and catching, and settling again, but when he makes a flit from cover to cover at any distance, I have seen him fly very high and boldly. It is also his custom to rise almost perpendicularly, and strike his wings over his back, after the manner of the Smiter Pigeon.

But the most singular attribute of the Nightjar is the loud noise he makes when seated upon some elevated point, and which has procured him the name of the "*Night Rail*." Almost every one knows the instances Gilbert White gives of the vibration caused by this sound when uttered by one of these birds, which was seated on the small cross of a wooden summer-house, in which he and some friends were taking tea. I have never had any similar proof of this, but I have got as near this bird when uttering this sound as it is possible to approach any wild bird, namely, under the very tree he was upon, and so loud did it sound, that I could easily realize the fact of a hollow wooden edifice being actually shaken by it, so as to cause a sensible vibration. I remember very well some years

ago a Nightjar had a predilection for the tops of some tall beeches which grew close to our house, and the sound was so sonorous that I have laid awake and anathematized him in no gentle terms or temper.

The resemblance which this bird bears to the ground upon which he ordinarily sits is carried out in his eggs and young, albeit that the former are by no means destitute of beauty. They are more spherical than ordinary, and are covered with every variety of brown and grey, in a very soft and varied pattern. They make no nest, but choose a bare patch or hollow of earth, sheltered by a near heath-tuft, and there the young are hatched, and lie like lumps of dirt or toads for a long time before they make any shew of feathers. The female will not readily desert her eggs, and her young never. She will suffer herself to be pelted, (as I remember to my shame,) and undergo every species of persecution, in one instance, as I also remember, actually extending to the loss of her tail, and yet she succeeded in rearing them; under the circumstances it was certainly little less than a miracle, but boys in their pursuit of natural history are sadly thoughtless, and little reck of the pain which they inflict. In inculcating the taste, never let the tutor forget to instil likewise the lesson of mercy.

Before leaving my *Caprimulgus*, I must refer to his feet, which are worth attention. He is sometimes called the Nighthawk, but this is a most ridiculous name, unless the fact of *preying* upon moths and beetles entitles him to it, in which case all birds which feed on living creatures are Hawks. However, his feet are very small and pretty, and answer no purpose apparently but that of perching, and yet the nail of the middle toe is serrated, or rather pectinated, that is, like a comb. The object of this provision does not clearly appear. Gilbert White thought that he had seen prey taken by the foot, but this was mere conjecture, and I don't see how such a formation could much assist in securing the prey; certainly the same formation is observable in the Heron, and in his case the prey is assuredly slippery enough, but it does not appear to me that we have any sufficient warrant upon evidence or observation for assigning any particular use for this natural comb, that is, there is nothing apparently to shew the necessity or particular use of such a formation in these two birds, and therefore, like many other things of the same nature, we must rest content with the conviction

"that not for nought
Was any one thing given or made,"

although we may not be able to discern its use.

In speaking of Owls as mousers, as is well known, a greenhorn coming to a farmer is invited to an expedition at what is called "Owl-catching," at which he is easily persuaded to play the subordinate part of standing

with a sieve below in the barn to catch the game, which is to be caught napping above and thrown down; but need it be said that after a little time a shower of dirty water, from a pailful taken aloft on purpose, soon discovers the true nature of this "Owl-catching."

Much controversy has arisen as to what is really a "Screech Owl." My own experience would decidedly fix this name on the Yellow Owl. The Brown Owl hoots, with the peculiar melancholy tremulous sound, which fills the ignorant with such terror as it breaks the silence of the midnight air. How often I have watched him against the moonlight, quivering on his perch! and, when all is said and done, there is great melancholy in it.

Another heath-bird which is nowhere numerous is the Stone Curlew, (*Charadrius Edicnemus*), and, from his wild habits and habitat, can never be so familiar as other wild birds. It is evident to me that these birds take very long flights. I have been in districts where they were by no means numerous, and yet it was evident as darkness came on, by their cries, which resounded on all sides, that there were very many on the wing. The note is between a whistle and a scream, and they have also a running note; the former supposed by Buffon to resemble the word *turlui*. These birds are somewhat wild, and difficult to come near, unless flushed by chance; they run very swiftly, and are off on the least alarm. Amongst the country people they are known under the general name of "Curlews." They bear a striking resemblance to the Golden Plover in shape, and vary a good deal in plumage, some specimens being very dark indeed, whilst others exhibit only the varieties of greyish brown, with a dark bar across the wing; and when in flight they have much the appearance of water-birds, and the same shape and buoyant flight. The eggs of these birds much resemble those of the Peewit, but lighter, and are placed on the ground, and very difficult to discover. The Common Peewit is somewhat of a nocturnal bird, as are many of the Ducks and Snipe genus, but the small hours of darkness are left to the undisturbed possession of the true nocturnals.

(To be continued.)

A SUMMER DAY AT SELBORNE, HAMPSHIRE.

BY W. G. J.

SIXTY years have come and gone since he that made Selborne a household word was laid under the sod; or, to count time as he in his lifetime used to do, sixty times has the Cuckoo left the vale, and sixty times has he returned; sixty times has the Swallow taken his migration to and from

our native isles;* sixty times have the beech trees in his beloved "Hanger" put forth their leaves, and sixty times have they strewed the plains; but while sixty years have thus passed away, the names of Gilbert White and Selborne are better known than when the latter contained the former, a living man.

To carry out a long-cherished desire, on a merry morn in June last we left Clapham by the South-Western Railway for Alton, the nearest point to Selborne by rail. Arrived there;—after going through the village, and immediately after leaving it to the left, you enter into a charming lane, with hedgerows on every side, noble conservatories for the botanist. Walking leisurely along, you here and there get through some opening a glimpse of a beauteous woodland scene, or a field covered by the hop-vines, now climbing vigorously up their poles, or it may be some fallow-field ploughed by the brown oxen, or you have to step aside to allow some joyous Giles to drive past his loaded wain. Amid such rural scenes, amid so much that was pleasing and lovely, many times did we verify the sweet language of Clare.

"Upon a molehill oft he dropt him down,
To take a prospect of the circling scene,
Marking how much the cottage roof's thatch brown
Did add its beauty to the budding green
Of sheltering trees it humbly peeped between;
The stone-racked waggon with its rumbling sound;
The windmill's sweeping sails at distance seen;
And every form that crowds the circling round,
Where the sky, stooping, seems to kiss the meeting ground."

But time progresses, and so must we. And now, having walked about four miles, crossing a bridge over the Well-head, you ascend a short rise, and

* The following I think worthy of record, not only as strengthening the fact of the return of the same Swallows to this country, but to the very neighbourhood where they had left the previous season. It is communicated by my worthy friend Thomas Durham Weir, Esq., of Boghead, Linlithgowshire, a man loved and respected by all who know him:—"The late Professor Macgillivray, of Aberdeen, being very anxious to ascertain if the White-rumped Swallows returned to the same locality, I caught several of them in September, 1838, and put small rings (silver) on their legs. In the beginning of May, 1839, a weaver shot one of these 'joyous harbingers of summer' in the neighbourhood of Whitburn, which is about three miles distant from Boghead. He observed a piece of parchment suspended from its leg, which had attracted his attention. He gave it to Mr. Nairne McNab, bird-stuffer, in Bathgate, who sent it to me. I was delighted on discovering that it was one of those Swallows which I had caught during the previous year. To the silver ring there was fixed with a silken thread a small piece of parchment, on one side of which was written distinctly, in a female hand, 'Madrid, 28th. March, 1839,' and on the other side 'Donna Maria;' as some of the letters of the surname were effaced, it could not be deciphered. Below the name there was a flaming heart pierced through by two arrows,—Boghead, 16th. August, 1856."

at once you are introduced to the Plestor,* as sweet a scene as could be looked on. In the centre of it, and surrounded by a wooden seat, stands a fine Sycamore, (*Acer pseudo-platanus*;) while to the left, and close by the church-yard wall, is a stately Horse Chestnut, (*Æsculus hippocastanicus*.) The cottages are covered by Roses and Honeysuckles, now yielding a glorious perfume, and not a few of these humble cottagers literally "sit under their Vines," if not "their Fig trees." In favourable seasons the Grape perfects its fruit. Proceeding a few yards up, the vicar's house appears, and a little further on the church-yard gate. Stepping in, the noble old Yew tree, (*Taxus baccata*;) which White so particularly writes of in his Antiquities, (Letter V.,) first attracts your attention. He gives its greatest measurement then as twenty-three feet, whilst it now is twenty-three feet four inches; in good health, pushing out new growths at every extremity. Altogether it is a tree quite equal to those of Borrowdale or Lartan's Vale, and will well bear out the solemn lines of Wordsworth addressed to these.

"A pillar'd shade,
Upon whose grassless floor of red brown hue,
By sheddings from the piercing umbrage tinged
Perennially—beneath whose sable roof
Of boughs, as if for festal purpose, deck'd
With unrejoicing berries, ghastly shapes
May meet at noontide—Fear and trembling Hope—
Silence and Foresight—Death the skeleton,
And Time the shadow—there to celebrate,
As in a natural temple, scattered o'er
With altars undisturb'd of massy stone,
United worship."

The church is a primitive looking building with a heavy tiled roof; at the west end a square embattled tower forty-five feet high somewhat relieves its low equal appearance; everything in and around is, however, clean and neat; there is a sacredness brooding over the whole place, meliorated by time, that the heart at once responds to, and feels deeply there is something here that the modern church, with its fretted roof, its gilded dome, and too often gilded preacher, cannot produce. Now, as in White's time, the south side of the kirk-yard seems to be the favourite resting-place; but passing over many graves round by the chancel, and on

* The Plestor, or Pleystow, as White describes it. In the centre of the village, and near the church, is a square piece of ground surrounded by houses, and vulgarly called the Plestor. And in Letter X. (Antiquities) he further states that in 1271 Sir Adam Gurdon, in conjunction with his wife Constantia, granted to the Prior and Convent of Selborne all his claim and right to a certain place, called "La Pleystow," in the village aforesaid, "in liberam, puram, et perpetuam clemosinam." This Pleystow, (in Saxon Plegestow or Plegstow,) locus ludorum, or play-place, is a level area near the church, of about forty-four yards by thirty-six, and is now known by the name of the Plestor.

its south side is the sweet resting-place of Gilbert White. All that tells such is the case is a simple stone about eighteen inches high, fifteen inches broad, rounded at the top, and the initials G. W., 26th. June, 1793. Above all compare is such a resting-place; the green daisy-covered sod exposed to the seasons preaching the silent lesson

"That plants and flowers
Anew do deck the plain;
The woods do hear the voice of Spring,
And flourish green again."

And lower down beneath that sod the lesson is also forced upon us

"That man, when laid in lonesome grave,
Shall sleep in death's dark gloom,
Until the eternal warning wake
The slumbers of the tomb."

Retracing our steps back through the Plestor, immediately to the right we come to the residence of White, his birth-place, his life-long abode, and where he died; indeed, with a few exceptions, his whole life may be said to have been spent in the district, almost in the parish of Selborne, and a place better adapted to a naturalist of White's stamp could scarcely be found. The house remains very much in the same state as White left it, excepting a wing added at the west end by the present proprietor, Professor Bell. The grounds are much finer than when White had them, although in making them so nothing characteristic of its former occupant has been sacrificed. His brick-laid walk is there, his sun-dial is there, his large Oak and Cedar still flourish; you may sit down and bring to your mind what his appearance was, and you have the picture of a former time complete.

Again, passing along the village, now much as it was in 1780, "a long straggling street," some houses thatched, and with their moss-covered ornaments present a pleasing appearance, some as the church, with square tiles, but all having a tidy and cosy aspect. At the east end of the village a path leads up to the Zigzag, (so named from its construction,) and as you ascend this, a most glorious landscape reveals itself to your gaze, such a sight as the soul delights to drink in through the eyes. This hill rises above the village about three hundred feet, and is divided into a sheep-down, a high wood, and a low wood called the "Hanger." This wood consists entirely of Beech, and growing as it here does on chalk, attains a beauty not elsewhere attained. The Beech tree, when it puts forth its young downy leaves in the early spring, is a cheering and lovely sight. In the autumn, when it assumes its rosy and brown tints, it lends a warmth to the landscape that no other tree does. No wonder then it was such a favourite with White. And this same "Hanger" is that wood

of which he writes so often, and which by his writings is known (at least by name) wherever the English language is spoken.

Sitting on the sheep-down, we can look around and over those scenes he so faithfully describes. In the distance is Wolmer Forest and pond; close by to the right is Nore Hill, beautifully wooded; below nestles the quiet village; and far away stretches the lovely scene, till the view is closed by the horizon, on the far-famed Downs of Sussex, round to Ryegate in Surrey. One pleasing feature in the sheep-downs are the bells attached to the sheep by a ribbon round their neck. Where there is nothing else to disturb the solitude, it is a pleasant, although not harmonious sound, the tinkling of each bell every nibble the sheep make. A train of associations are at once called up; we are led back to the time of the patriarchs, when the riches of that day were so invested, even to the time when Abel offered up the firstlings of his flock, till that glorious time when the shepherds, watching their flocks by night on Bethlehem's plains, beheld the star pointing the birth of our and the world's Great Shepherd.

It is somewhat interesting, too, on looking down from this eminence, to see the Swift and Swallow sporting below, the same as in the days of White; and coming through the woods, we are saluted by the mellow pipe of the Blackbird, the commanding note of the Thrush, and the laughing-like notes of the Willow Wren, all going on as they did sixty years ago. And now the thought, after having seen all these quiet scenes, and knowing the unobtrusive life White led, is forced upon us, how is it with these materials and in so simple a way has White produced such a book, which is prized by young and old, by scientific and non-scientific readers? It may be advanced as the grand cause that he "described everything simply and truthfully, recorded only as facts such as were known, and could be proved to be such, and he never forgot that one hand only fashioned all the objects which gave him pleasure and interest to observe, and that the same power regulates their continuance or change." In his forty-ninth letter he says, "It is now more than forty years that I have paid some attention to the Ornithology of this district, without being able to exhaust the subject; new occurrences still arise as long as enquiries are kept alive." Now this applies to a single parish. It shews very strikingly that Natural History, when studied in the way and in the light White studied it, is no mere waste of time, as too many suppose. If it can call up fervent reflections and sagacious reasonings, if it can keep a mind engaged for forty years without cloying, if it can yield pure delight and unblemished happiness, if its pursuit can keep mind and body in good health till the threescore years and ten are overreached, surely it may be argued this of itself is no small gain in this changing scene. But when we come to add, and to feel as he did, that the works of Nature are indeed the works of

God, that when we study these works in a right spirit we are but reading a portion of His many-leaved book, that which He pronounced six thousand years ago to be very good, and which were placed here, no doubt, for our study. It was in this spirit and with these feelings White pursued his studies; it is in this spirit and with these feelings we would have all to study the works of Nature; and when so studied, we will feel the full force of the inspired Psalmist's exclamation—"O Lord, how manifold are Thy works! in wisdom hast Thou made them all: the earth is full of Thy riches. The glory of the Lord shall endure for ever: the Lord shall rejoice in His works."

Our short remarks are made not with a view to act as a guide to a place so well known, for it is not needed; it is meant as a memorial of a happy day spent among the scenes of the parish of Selborne, a place that is, and will continue to be, sacred to every one who cherishes the memory of Gilbert White; and who that has read his interesting History does not?

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 14.)

20. *Phragmatobia lubricipida*.—By no means so common as its brother *Menthrastris*.

N.B.—In the larva state this insect is more abundant than its congener, *Menthrastris*. Before they change their last skin it is almost impossible to distinguish the larvæ of *P. lubricipida* and *P. fuliginosa*, and their food-plants are the same. After its last moult, the larva of the latter insect loses the rather conspicuous, whitish, dorsal stripe, and becomes much more hairy than that of *Lubricipida*. It moreover hibernates, whilst the other invariably assumes the pupa state in the autumn. (C.)

21. *P. menthrastis*.—Most collectors, who have tried light as a method of attracting insects, will agree with me in execrating this species. The protracted period of its appearance in the perfect state, its abundance, its pertinacity in returning to the window after being forcibly ejected, and finally, its blind and warm affection for the candle, combine to render it a perfect nuisance. I have only met with one variety, a pure white, devoid of markings. I have

little doubt that here, as elsewhere among the Bombyces, some of the larvæ hatched from the eggs deposited in July and August, can be made to feed up rapidly, so as to produce the perfect insect in the same year.

N.B.—I most feelingly concur in my friend Mr. Greene's remarks on this insect's penchant for light. It is the most irritating thing in the world to have five or six of these insects striving round one's candle for the first chance of self-immolation. (C.)

22. *P. mendica*.—I once or twice met with the pretty ♀ of this species sporting about, in the noonday, on the banks of a stream running through Playford, but it seemed to be rare. It is a curious circumstance that the ♀ and not the ♂ should be found flying in the day-time.

N.B.—I have twice reared a brood of larvæ from the egg. I fed them upon various species of mint and *Epilobium hirsutum*, (The Great Willow-herb.) It is rather difficult to distinguish this larva from that of *P. lubricipida* and *P. fuliginosa*: the latter it most closely resembles. The ♂ must be killed as soon as ever they are dry, after emerging from the pupæ, or they utterly ruin themselves. I am surprised that this insect does not come to light, but I never heard of its doing so. My larvæ were full fed, and spun up in August. Some of them went just below the surface of the soil. (C.)

23. *L. monacha*.—By no means rare in the larva and pupa state. The larva may sometimes be found, like that of *A. Aprilina*, during the day-time, in the crannies and chinks of the bark of oak trees. Here also the singular pupa may occasionally be detected by entomological eyes.

N.B.—I have bred this insect from larva beaten off birch. Mr. Stainton, on the authority of Oechsenheimer, states in the Manual, that it feeds on *fir*, but I cannot think that it ever does so, and have no doubt that the mistake arose from its having been found resting on the bark in the day-time. (C.)

24. *P. salicis*.—Poplar being a very common tree in Suffolk, this insect is proportionately abundant. I remember, some years ago, being at Hammer-smith, where a row of poplars bordered the river. The quantity of *wings* of this insect was almost incredible. I was digging for pupæ at the time, and some idea of the number may be formed when I say that I had actually to scrape them away with the trowel. I once bred a specimen with a round hole in the left hand forewing. It is now in the collection of the Royal Dublin Society. The immature caterpillar much resembles some of the *Lithosiæ*.

25. *L. auriflua*.—Some change having taken place in the nomenclature of this species and *Chrysorrhæa*, I am not sure which is which. Whichever is the common one, is as common in Suffolk as elsewhere, and in its aggravating powers emulates *Menthrasti*.

26. *O. fascelina*.—I found about thirty larvæ of this insect on broom in the middle of May. I fed them up in my garden under muslin, and bred about half of them beginning of July. It is a difficult insect to rear, and, with me, almost impossible to do so, except on the growing plant. (B.)

N.B.—I used to take the larvæ of this insect at Cambridge, upon the hawthorn hedges. I took them this year, near here, on broom, but not being

able, like my friend Mr. Bree, to feed them on the growing plant, and give them plenty of sun and air, they all died. (C.)

27. *O. pudibunda*.—Not uncommon. The beautiful larva may be found on almost every tree. The colour of the tufts varies from bright yellow to dirty brown. In forming its cocoon it produces more silk than any other British insect. The cocoon indeed, in colour and consistency, strikingly resembles that of the famous *B. mori*.

N.B.—I have always found that the dirty brown or rather smoky-looking larva produced ♂ and the lemon-coloured ones ♀. (C.)

28. *O. coryli*.—Strange to say, I never met with the slightest trace of this insect, though oak and hazel abounded, both at Playford and Brandeston. Perhaps my fellow-labourers may have been more fortunate. I may just mention that the larva varies in colour from pale primrose to brick red.

N.B.—I bred this insect from larvæ taken in the autumn of 1856, this spring, 1857. (B.)

I have taken the larvæ in tolerable plenty in the woods round Ipswich, and both larvæ and perfect insect in the woods near here. The moth appears in May, and flies, almost before it is dark, along the hedges and ridings. I had this year a brood of eggs, laid the 27th. of May; from these I had about thirty pupæ in August. On October 28th., three ♀ and one ♂ made their appearance, and since then two more ♀ and one ♂ have emerged. I attribute this premature development to the very hot summer and extraordinarily mild autumn. The insect is, however, double-brooded, as I have beaten the larva *full-fed* in July, and the perfect insect appeared the following August. I have beaten the larva off beech, hazel, maple, and oak. It prefers the two former. It may be interesting to remark that all the five ♀ I bred this autumn were full of eggs. I have kept some of them in the hope that they are impregnated, and will hatch in the spring. The ♂ flies I may say before his wings are dry, and it is next to impossible to secure a good specimen, even when bred. (C.)

29. *O. antiqua*.—Very common.

30. *C. Neustria*.—In immense profusion. The larva was a perfect pest, crawling over the walls of the house, and entering the bed-rooms, in fact "putting in an appearance" in the most unexpected places. This seems to me a convenient place to make inquiries on a subject which has puzzled me ever since I began to collect, namely, "what becomes of the perfect insect in this and other species?" I could not have observed less than from four hundred to five hundred larvæ of this insect; I am certainly beyond the mark when I say that I did not see a dozen of the imago. Now, making every allowance for ichneumons, muscardine, birds, and every other ill to which caterpillar flesh is heir, is not this an immeasurably small proportion? The trifling number of perfect insects, (at least the trifling number *visible*), compared with the abundance of larvæ, must have struck every collector. Look at the vast number of eggs deposited by one single female *cava*! see the caterpillars by hundreds feasting on juicy nettles, or scuttling across the footpath, and yet how many have seen a dozen specimens of the perfect insect during their

whole entomological career? Take again *D. ceruleocephala*. Every hawthorn hedge swarms with the conspicuous larvæ of this species; yet, during seven years collecting, I never saw a specimen of it on the wing, and I doubt not that many others are in the same predicament. In fact, as regards the *Bombyces*, I conceive that I do not exaggerate in asserting, that nine-tenths of the specimens in our cabinets have been produced from the egg, larva, or pupa, that is, have been obtained in one or other of those stages of their existence. It is unquestionably true that an occasional capture is made on the trunks of trees, on palings, or at light; but if some of our collectors, (who keep one or two *rows* of each species,) trusted to *this* method of supplying their wants, they would painfully realize the truth of the saying, that "hope deferred maketh the heart sick." Can any one explain the cause or causes of the paucity of this order in the perfect state? We have all heard or read of ivy-hunting, swallow bloom, sugaring, pupa-digging, etc., and these subjects are well-nigh exhausted; but it still remains open to the enthusiastic aspirant after Entomological honours to disclose to us the habits, haunts, and "favourite varieties" of the *Bombyces* in the last stage of their existence. It is said, I know, that they come to light. I think I have tried that method as perseveringly as most people; but, with the exception of, at the outside, a dozen species, and those very common, I never found a *Bombyx* come to light. Besides, the few that do come are generally males, and they are so irritable in their tempers, and excitable in their movements, that it is no easy matter to capture them. When this feat is at length accomplished, and the stupified insect (which is almost sure to be found lying on its *back*) is examined, there meets the expectant collector's eager gaze a—but I need not go farther; every one knows what I mean. We have a very remarkable exception to the above observations in one of the *Sphingidæ*, namely, *S. convolvuli*, which, though not unfrequently observed in the *perfect* state, has very rarely been taken in the preceding stages in this country. Mr. Weaver once found the larva near Birmingham, I believe; and I myself, when in Gloucestershire, once bred a fine specimen from a pupa found in my garden.—These are the only cases I know of.

N.B.—I think Mr. Greene's remarks about the scarcity of this and other *Bombyces* in the imago state, arises principally from the simple difficulty of getting them at night, their habits being so different from those of the *Noctuæ* or *Geometræ*. Having no spiral tongue, they do not of course come to ivy, swallow, or sugar. They do not, as a rule, fly about in twilight, like the *Geometræ*, but many of them, such as *L. griseola*, *complanata*, *complanula*, and *stramineola*, *L. chrysorrhea*, *O. pudibunda*, *P. populi*, *cassinea*, etc., come here freely to light; while several other species are beaten or found on trunks and palings abundantly. (B.)

I have not very unfrequently taken the ♂ by putting a candle at my bed-room window. This and several other of the *Bombyces*, e.g. *P. cassinea* and *P. populi*, do not, I think, fly till an hour or two after dark, and can only be attracted by a very bright light. There is a row of six or seven gas-lamps just outside this town. About a fortnight since Mr. Bree and myself turned out about half-past nine p.m., to examine them. They were all

burning dimly except one. At the dim lamps we found a solitary ♂ *P. populi*, whilst at the one bright one we took six in about five minutes. I believe, entomologically speaking, it would pay any one residing in a tolerable locality to keep a bright lamp burning from nine to twelve p.m. throughout the season. A very large per centage of the produce will, of course, be ♂. Breeding is the only certain mode of procuring the ♀ of the *Bombyces*. (C.)

(To be continued.)

A LIST OF THE INSECTS OBSERVED IN THE SOUTHERN PART OF THE COUNTY OF SUSSEX.

BY W. C. UNWIN, LEWES.

No. II.—THE SYRPHIDÆ CONCLUDED.

(Continued from page 20.)

Cheilosia lucorum.—Not uncommon in May and the following months in the Plashet Wood, the plantations near Firle Park, at Chailey, and elsewhere.

C. æstracea.—Rare. The Plashet Wood, on *Heracleum sphondylium*, (the Common Cow-parsnip,) in July.

C. means.—Frequently met with on the flowers of the *Ranunculi*, by roadsides and in meadows, in April and May.

C. chlorus.—This fine insect is not uncommon in May, June, and following months; frequenting the flowers of *Ranunculus bulbosus* and *acris* especially.

C. albitarsis.—Not unfrequently observed in the spring and summer months affecting the same localities as the last species.

C. mutabilis.—A few examples of this species have been observed, but rarely, in meadows near the woods in this neighbourhood, in May and July.

C. scutellata.—Not common: in April and May.

C. chalybeata.—Rather rare in this district in spring.

C. funeralis.—Not uncommon in June, July, and August, on the *Compositæ*, especially the Common Ragwort, (*Senecio Jacobææ*), as well also on the *Ranunculi*.

Syrphus pyrastris.—Very abundant everywhere. This fine handsome species is to be found throughout the summer months, now hovering with apparently invisible wings over flowers, and then sipping their nectar: if once alarmed it darts away with amazing rapidity. All the *Syrphi* fly very swiftly, and most of the species may be observed in flower-gardens, enjoying the hottest sunshine of a July or August day.

S. grossulariæ.—Rare. Once captured in a garden at Firle.

S. ribesii.—Common in gardens and elsewhere during the summer months.

S. vitripennis.—Abundant. And found in the same situations with the preceding throughout the summer; often frequents the *Umbelliferæ*.

S. bifasciatus.—Equally common with the two former species.

S. luniger.—Not uncommon in gardens and the borders of corn-fields.

S. arcuatus.—Rare. Near the Plashet Wood in May and June: it may

be readily distinguished from its allies by the dark brown stigma on the wing.
S. corollæ.—Common in gardens, hovering over or settling on flowers; also in meadows on the *Ranunculi* and *Senecio Jacobæa*, (Common Ragwort,) in June and following months.

S. balteatus.—Abundant. Frequenting the flowers of the *Ranunculi* and *Senecio Jacobæa*; it may often be observed basking on the leaves of plants and shrubs: appearance from June till September.

S. tricinclus.—Rare. It has been observed in the Plashet Wood, near Brighton, and at Firle, in June.

S. laternarius.—This species is comparatively rare. It has been captured at Pevensey, on the shingle, off the Common Ragwort, (*Senecio Jacobæa*,) in August.

S. albostrigatus.—Rare. Captured with the preceding species in the same locality and at the same time.

S. cinctus.—Not common. Has been found in Blind Lane, Ilford, and near Newhaven, in May.

S. manicatus.—Common. Frequents flowers by the road-sides generally, and the borders of corn-fields from April throughout the summer.

S. peltatus.—Several specimens were taken off the Ragwort, (*Senecio Jacobæa*,) in July, 1854, at Pevensey, and also at Eastbourne, but it has not been observed in the neighbourhood of Lewes.

S. clypeatus.—Not uncommon on *Ranunculi* and *Umbelliferae* in favourable situations in April and the following months.

S. scutatus.—Like its congeners it is very partial to the *Ranunculi* and the Ragwort, and is very general in this locality.

S. cyaneus.—Abundant everywhere from April to September in sunny weather.

S. rosarum.—Rare. One specimen only has been noticed.

S. mellinus.—Occasionally observed, but not common; near Lewes and near Chailey, in May and following months.

S. scalaris.—Of very frequent occurrence in May and June, on the flowery banks generally. It is very partial to the *Ranunculi* and Ragwort.

Doros citrofusciatus.—Rare. Two examples were captured near Firle in July, 1845, and had not been observed since, until the present year, when it was detected amongst a collection of *Diptera* and *Hymenoptera*, made by a young friend near Brighton.

D. ornatus.—Not so rare as the last, and has been captured at Ringmer, and also near Newhaven, in May and June.

Melithreptus scriptus.—Common. Frequenting warm banks generally, wherever the Common Ragwort (*Senecio Jacobæa*) grows, in July and August. It is a beautifully-marked insect.

M. menthrasti.—Not so common as the preceding species. It affects the same situations at the same period.

M. taniatus.—Rare. Near Winterbourne, and in a lane near Landport, in May and following months.

Buccha elongata.—Uncommon. Has been observed in the Plashet Wood, in June.

Ascia podagrica.—Abundant. A very pretty little species; found the end of March, in early springs, on the blossoms of the Blackthorn and the Strawberry-leaved Cinquefoil, (*Potentilla fragariastrum*,) and continues one of the many associates of bright sunny summer weather until autumn.

(To be continued.)

The Food-plants of Gonepteryx Rhamni.—I have looked over the paper on the Suffolk Lepidoptera, in "The Naturalist," and think it a very interesting one. I notice Mr. Crewe's remarks about the larvæ of *G. Rhamni*. I used to fancy that they must feed upon some other plant beside the two species of *Rhamnus*, but I never could detect them upon anything else. Lewin mentions the Wild Rose, but I think this is a mistake. I once saw a female *Rhamni* in a lane where scattered bushes of *Rhamnus Catharticus* grew in the hedge, mixed with White-thorn, Black-thorn, and abundance of Dog Roses, but she invariably selected the Buck-thorn to deposit her eggs, even when it was closely entwined with other shrubs.—H. DOUBLEDAY, Epping, November 20th., 1857.

P. fuliginosa.—I must dissent from my friend Mr. Crewe's opinion that this insect occasionally passes the winter in the *pupa* state. Though the majority of my larva spun up at the beginning of March, yet a considerable number turned to pupæ at the end of February, and produced the perfect insect in *twelve* days.—J. GREENE, Pembroke Street, Dublin.

Chrysophanus dispar.—In the "Zoologist," for December, 1857, and the "Zoologist" and "Naturalist" for January, 1858, Mr. G. H. King inserts an advertisement in which he offers *Chrysophanus hippothoe* for sale, collected by himself during the past season in the fens. Now, with the single exception of one specimen taken this last season in Somersetshire, and recorded in the "Intelligencer," No. 47, by Mr. Crotch, this insect has not been met with in Britain for eight or ten years. It was formerly abundant in the fens of Cambridgeshire and Huntingdonshire, but from these localities (to which it was I believe strictly confined) it has since then entirely disappeared, and though it has diligently been sought for not a single specimen has, to the best of my knowledge, been seen or heard of. Mr. King was collecting this summer in Horning Fen, near Norwich; this locality has been well worked by some very diligent entomologists for some years past, but I never heard of *C. dispar* being seen or taken there. Mr. King was here in August, and shewed both Mr. C. R. Bree and myself the insects which he professed to have taken at Horning, there was no *C. dispar* among them, nor did he say one word about having taken it. I do not wish for one moment to cast a doubt on Mr. King's veracity, but when we hear of one hundred and fifty pupæ of *Not. Carmelita* being imported from the Continent, and such insects as *O. lunaris* and *T. vespiforme* turning up common, it really does make us all suspicious. I do not ask Mr. King to give us the exact locality. In these days of insane and

ruthless extermination it would be unwise and impolitic to do so; but I must tell him as a friend that unless he gives us the neighbourhood, date, and manner of its capture, I very much fear that his advertisement will not only be a dead letter, but will most seriously damage his reputation as an honest dealer. As a dealer in insects Mr. King comes before us in a public capacity, and must therefore be prepared to give the fullest information as to the genuineness of the articles he vends. *C. dispar* does occur on the continent, but it is excessively rare, so much so that in its palmy days here it was bought up on all sides by the continental collectors. It is, I believe, common in Nubia, but I am not aware of any other locality. Will Mr. King be good enough to tell us whether by *C. hippothoe* he means *C. dispar*, and if so, when, where, and how he took it?—H. HARPUR CREWE, Stowmarket, Suffolk, January 13th., 1858.

Argynnis dia.—We have heard all the circumstances connected with the supposed capture of this insect, and we are bound to say that we do not think a sufficient case has been made out to warrant its admission as a British species. We entirely exonerate the gentleman whose name has been connected with it from the imputation of having made the slightest wilful misrepresentation, but we believe that a mistake has occurred, and the identity of the insect taken has been confused with some of the Foreign insects that gentleman had in his possession. The extreme scientific interest which is attached to the addition of any fresh Lepidopterous insect to our Fauna, and the readiness with which such an admission real or erroneous, is followed by the importation of a large family of the "insect new to Britain," the following year, demands that all newly-discovered species should be free from even the shade of suspicion. We regard the word of a gentleman as sufficient proof of his sincerity, and as settling at once the truth of his statement *as far as his belief is concerned*, but in the case of *Dia* two distinct statements as to its capture have been made, both of them essentially different, and the possession of foreign insects by that gentleman, coupled with these statements, leads to the inevitable inference that a mistake may have occurred.—ED.

Exchange Boxes.—The great desideratum in these boxes is to get size united with strength and lightness. We have lately had some made, corked on both sides, five inches by two inches and three-eighths, which unite all the above requirements. Mr. Betts, Cabinet Maker, of this place, will make them for one shilling each, and will send a specimen box on receipt of sixteen penny stamps. They will go through the post in wool for fourpence.—ED., Stowmarket.

Are the Lithosiæ attracted by sugar?—One evening last summer, I found three specimens of *L. griseola* on a tree I had sugared, together with four or five *S. xanthographa*. They were on the part of the trunk that was sugared, but whether feeding or not I was unable to determine. I should imagine the sugar had some attraction for them, as Mr. Bree mentioned a similar instance of *L. helveola* in last month's number of this magazine. I mention this fact

as the Editor suggests that it was doubtless at rest on the tree, and not feeding.—JOHN PORTER, JUN., 8, East Street, Lewes, December 14th., 1857.

Nottingham Natural History Society.—We are glad to find by a letter from Mr. J. H. Wood, that this Society is in a prosperous condition. On the 17th. of November an excellent paper was read by Mr. Morley, on Lepidopterous Insects, which contained much interesting information, and many observations especially valuable to the student. The meetings are held weekly, when a paper is read upon some subject connected with Natural History—these papers being for the most part the result of the writer's personal experience and observation. This is the right principle to act upon, and we wish the Society every success. We shall be glad at any time to receive a report embodying any original facts brought before the Society.

Cambridge Entomological Society.—The November meeting of this Society was held on Friday, the 27th. ult., at the Secretary's rooms; F. Barlow, Esq., Vice President, in the chair. The following are the names of the members balloted for and elected:—F. Stainforth, Esq., Queen's College; Mr. L. Cumming, Cambridge; H. S. Bainbridge, Esq., St. John's College; F. H. Knapp, Esq., Pembroke College.—Mr. Preston read a paper on the structural differences observable in the several stages of Lepidopterous insects. Passing over the varied forms of the egg, Mr. Preston commenced by a description of the structure of the larva; he sketched the various organs of the head and trunk, with the abdomen; he dwelt at some length on the structure of the mouth. Respecting the internal organization the author noticed in succession the nervous, the digestive, the circulatory, the respiratory, and the muscular systems. Pointing out the arrangement in each, and especially the wonderful development of the last-mentioned in the larvæ of insects. Mr. Preston then enumerated the various changes that the organs of insects underwent in passing through the pupa stage to that of the imago. The parts of the body of the imago then were described and their purposes explained. Several diagrams were exhibited as illustrative of the subject.—After the chairman had tendered the thanks of the meeting, an interesting discussion arose from some questions put by Mr. Dunning, Mr. Bree, and Mr. Crewe, regarding the sensations of insects.—The "vexed question," as to the advisability of keeping pupæ dry or moist, was also discussed.—Mr. Brown exhibited *H. peltigera*, taken near Newmarket; also very pale varieties of *Nenia typica* and *Pacilophasia marginaria*, and two specimens of *Dosithea eburnata*.—Mr. Barlow exhibited a splendid insect nearly black, which was said to be a variety of *Galleria cereana*, also a fine series of *cereana* which were distributed.—Mr. Crewe exhibited a box of *Eupithecia*.—Mr. Preston exhibited *Cynips aptera*.—Mr. Sealy exhibited a series of *L. calluna*, collected in Pomona, Orkney, during the past summer. The meeting broke up at half-past ten.

A. F. SEALY, HON. SEC.

70, Trumpington Street, Cambridge.

Review.

Species General des Lépidoptères. Par M. BOISDUVAL et GUENÉE. *Tome IX.*
Uranides et Phalénites. Par M. A. GUENÉE. *Tome I.*

At length we have an instalment of the long-expected work on the *Geometridæ*, by M. Guenée. The first volume, and the two *livraisons* of plates for both volumes are before us, and we hasten to give a short *resumé* of M. Guenée's arrangement.

The *Uraniles* are a small section of Lepidoptera, chiefly exotic, having a general contour much like our Swallow-tails; and M. Guenée places them between the *Pyralites* and the *Geometræ*—simply because he can find no better place for them.

The *Phalénites* or *Geometræ* of Linnæus, occupy the rest of the present volume and that which is to come. The first family in M. Guenée's arrangement is the URAPTERIDÆ; and *U. sambucata*, the type of the genus *Urapteryx*, will henceforth occupy the first place in our collections of *Geometridæ*. Then follows the second family, ENNOMIDÆ, the British genera of which are 1.—*Epione*, in which the Linnæan name of *Vespertaria* is substituted for *Parallellaria*, W. V. 2.—*Rumia*. 3.—*Venilia*. 4.—*Angerona*. 5.—*Metrocampa*. 6.—*Ellopia*. 7.—*Eurymene*. 8.—*Pericallia*. 9.—*Selenia*., Hub., which now includes *Illunaria*, *Lunaria*, and *Illustraria*. 10.—*Odontopera*. 11.—*Crocallis*, which includes a species from Van Dieman's Land, called *Newmannaria*, after Mr. E. Newman. 12.—*Ennomos*. 13.—*Himera*.

The family AMPHIDASYDÆ includes, 1.—*Phigalia*. 2.—*Nyssia*. 3.—*Biston*, which only contains *B. hirtaria* and its varieties. 4.—*Amphidasia*, containing *Prodromaria* and *Betularia*.

The family BOARMIDÆ includes 1.—*Hemerophila*. 2.—*Cleora*. 3.—*Boarmia*. 4.—*Tephrosia*. 5.—*Gnophos*, the typical species of this genus is *G. obscurata*, which includes our *G. pallaria*. 6.—*Dasydia*. 7.—*Psodos*. 8.—*Mniophila*, (*Tephrosia* of Hub.)

The small family of BOLETOBIDÆ, containing only three genera, has one British genus, *Boletobia*, and one British representative, *B. fuliginaria*.

The family GEOMETRIDÆ contains: 1.—*Pseudoterpna*, (*Hemithea* of Dup. and H. D's catalogue.) 2.—*Geometra*, containing *Papilionaria* and *Smaragdaria*. 3.—*Nemoria*, containing *C. viridata* of H. D's catalogue. 4.—*Iodis*, containing *Vernaria* and *Æruginaria* under the Linnæan name of *Lactearia*. —*Phorodesma*. 6.—*Hemithea*, in which, under the name of *H. thymiaria*, Alb., we find our *C. æstivaria*,

The family EPHYRIDÆ contains *Ephyra*; and the last family in the volume, the ACIDALIDÆ, contains 1.—*Hyria*. 2.—*Asthena*, in which we find *A. luteata*, *candidata*, *sylvata*, and *blomeraria*. 3.—*Eupisteria*. 4.—*Venusa*, in which, under the name of *V. cambriearia*, we find our *Coremia erutaria*. 5.—*Acidalia*.

The plates are exceedingly well done, but as they represent the types of the *Geometridæ* of the world, of course our little island has not many representatives. In the larvæ we have our full share, viz., *E. fuscantaria*, and

Eupithecia assimilata, Dbd. Among the imagines the British species figured are *E. fuscantaria*, *Eupethecia plumbeolata*, *nanata*, *vulgata*, *dodoneata*, *pulchellata*, *subnotata*, and *abbreviata*; *Cidaria miata*; *Aleucis pictaria*; *Cidaria russula*, variety *perfuscata*, Haw.; *Emmelesia affinitata*, Steph.; and *Oporabia autumnata*.

The preface to the volume concludes thus:—"In conclusion, I cannot resist the pleasure of closing this list by a name which I cannot repeat too often, that of my excellent and useful friend, H. Doubleday, of Epping, who seems to have devoted to my work, and even to the enriching of my collection, a more active zeal than many others display in their own interest." We are sure there are very few, if any, British Entomologists, who will not feel pleasure in reading this testimony of the first of European Lepidopterists, to the worth of so good a naturalist and so excellent a man.

The work, of which we have given this brief notice, is marvellously cheap. The letter-press, of five hundred and fourteen pages large octavo, and closely printed in small type, is only five shillings and sixpence. The plates to the two volumes, twenty-three in number, including one on the *Siculidæ*, which is published here by mistake, as it belongs to volume xi., are only twelve shillings most accurately coloured. They have been supplied to us by Messrs. Williams and Norgate.

P.S.—We are sorry to observe, since the above was written, that some, we think, very ill-timed remarks have appeared in the "Intelligencer," on the long-deferred appearance of M. Guenée's truly splendid work. When we consider the trouble which it costs us to form a collection of British Lepidoptera, we may form some opinion of the immense labour which is required to arrange the Families, Genera, and Species, with all their Synonymes, of those of the entire world. M. Guenée has been working for years, at great sacrifice of time and health, at this truly Herculean task, and we can assure him that the Entomologists of Great Britain fully appreciate the value of his labours, and pay due homage to the fame he has so justly earned.—Ed.

Miscellaneous Notices.

The Missel Thrush, (*T. viscivorus*).—While *en route* to some distant shooting-ground, the tediousness of the journey was enlivened by many an ornithological anecdote. Among others, my companion, W. Faussett, Esq., of Binbrook, related the following:—"The Lady Soapsuds, *anglicé* washerwoman, came in great perplexity to inform her mistress that three lace collars were missing from the lines where they had been hung up to dry. Various were the conjectures as to what had become of them, but all inquiries for their recovery failed, until the gardener's notice was attracted by something white upon the branch of a tree; this proved to be one of the missing collars, fluttering from the side of a Missel Thrush's nest. The other two were found imbedded in the nest when pulled to pieces." I believe this to be not an uncommon circumstance; the blackbird is

constantly in the habit of weaving extraneous matter into its nest, such as newspapers, etc., but I think it proves an act of extreme boldness in the bird, to take the collars from the lines on which many other things were hanging, which in a common way would rather tend to banish than attract it. The length, too, of the articles must have been no small difficulty during their journey through the air.—R. P. ALINGTON, Rectory, Swinhope, November 27th., 1857.

Mildness of the Season.—Mr. Pennoek Newton, tailor and draper, of Fryup, had a boiling of new potatoes to dinner on Sunday last, grown in the open air at the Buscoe Beck Farm.—*Yorkshire Gazette*, January 2nd., 1858.

Proceedings of Societies.

Thirsk Natural History Society.—Botanical Exchange Club.—The monthly meeting of this society was held on the evening of Wednesday, December 2nd. Mr. J. G. Baker reported proceedings in the matter of the Botanical Exchange Club, and read letters relative to it from Messrs. Babington, Watson, and others. The following botanists were duly enrolled as members, namely, Rev. F. Addison, Cleator, Whitehaven; Rev. W. R. Crotch, Uphill House, Weston-super-Mare; Miss Gifford, Minehead, Somerset; John Hardy, 43, Radnor Street, Hulme; G. E. Hunt, Manchester; David Moore, A.L.S., Botanic Gardens, Glasnevin; Henry J. Payne, Barnsley; John Tatham, Settle; H. C. Watson, F.L.S., Thames Ditton, Surrey; John Windsor, M.D., F.L.S., Piccadilly, Manchester; E. G. Varenne, Kelvedon, Essex. He exhibited specimens from Mr. Watson, of a monstrosity of *Primula vulgaris* with metamorphosed calyx, collected near Claygate, Surrey, in 1857, and laid before the meeting the following list of species, one hundred and eighteen in number, collected or noticed by himself at an elevation of at least eight hundred yards above the sea-level, about the summit of Micklefell, North-west Yorkshire, the highest hill in the county, in an excursion made during the summer of 1856:—

Anemone nemorosa, Ranunculus acris, Cochlearia officinalis, (alpina,) Draba incana, D. verna, Cardamine pratensis, Viola sylvatica, V. lutea, Arenaria verna, Cerastium triviale, Oxalis acetosella, Trifolium repens, Potentilla tormentilla, Rubus chamaemorus, Alchemilla vulgaris, Saxifraga hypnoides, Chrysosplenium oppositifolium, Galium saxatile, Hieracium pilosella, Taraxacum officinale, Bellis perennis, Achillæa millefolium, Campanula rotundifolia, Calluna vulgaris, Vaccinium myrtillus, V. vitis-idaea, Gentiana verna, Veronica serpyllifolia, V. officinalis, V. chamaedrys, Thymus serpyllum, Prunella vulgaris, Rumex acetosa, R. acetosella, Empetrum nigrum, Juncus

squarrosus, *Luzula campestris*, *Scirpus cæspitosus*, *Eriophorum angustifolium*, *Sesleria cærulea*, *Poa annua*, *Festuca ovina*, (vivipara,) *Nardus stricta*, *Polypodium vulgare*, *Allosorus crispus*, *Cystopteris fragilis*, *Aspidium aculeatum*, *Lastrea filix-mas*, *L. dilatata*, *Asplenium viride*, *Blechnum boreale*, *Lycopodium clavatum*, *L. alpinum*, *L. selago*, *Andræa alpina*, *A. rupestris*, *A. Rothii*, *Sphagnum cymbifolium*, *S. acutifolium*, *S. cuspidatum*, *Dicranum pellucidum*, *D. flavescens*, *D. scoparium*, *Distichium capillaceum*, *Trichostomum flexicaule*, *Tortula tortuosa*, *Encalypta ciliata*, *Schistidium apocarpum*, *Racomitrium aciculare*, *R. fasciculare*, *R. heterostichum*, *R. lanuginosum*, *R. canescens*, *Orthotrichum cupulatum*, *Pogonatum alpinum*, *Polytrichum commune*, *P. juniperinum*, (alpestre,) *Aulacomnion palustre*, *Bryum polymorphum*, *B. nutans*, *B. Wahlenbergii*, *B. pseudo-triquetrum*, *B. inclinatum*, *B. capillare*, *B. julaceum*, *B. Zierii*, *Mirum hornum*, *M. undulatum*, *M. punctatum*, *Bartramia fontana*, *B. pomiformis*, *B. ithyphylla*, *B. arcuata*, *Sphlachnum sphæricum*, *Fissidens adiantoides*, *Antitrichia curtipendula*, *Isothecium myurum*, *I. myosuroides*, *Climacium dendroides*, *Hypnum plumosum*, (alpinum,) *H. rutabulum*, *H. prælongum*, *H. catenulatum*, *H. heteropterum*, *H. cuspidatum*, *H. Schreberi*, *H. tamariscinum*, *H. splendens*, *H. triquetrum*, *H. loreum*, *H. squarrosus*, *H. fluitans*, *H. revolvens*, *H. commutatum*, (condensatum,) *H. molluscum*, *H. undulatum*, *H. sylvaticum*. Of these, two of the Mosses, *Bryum polymorphum* and *Hypnum catenulatum*, are new to North Yorkshire.

Mr. J. H. Davies noticed the following unrecorded stations for muscological rarities, in each case exhibiting specimens from his own or Mr. Baker's collection:—*Dicranum spurium*, Hedw.: North Yorkshire; plentiful in boggy places on Pilmoor; first noticed by Mr. Baker in the spring of 1857. Aberdeen, Ben-na-bourd, Braemar, July, 1854, A. Croall. *Campylopus brevipilus*, B. and S.: North Yorkshire. I am indebted to the kindness of Mr. Wilson for specimens of this species, which has only been gathered in Britain once before, and that many years ago, collected by himself in moderate plenty, with *Dicranum spurium*, in an enclosed piece on the Flaxton side of Strensall Common, September 30th., 1857.

Tortula papillosa, Wils.: Gloucestershire; trees near Cheltenham, 1857, H. Beach. North Yorkshire, on a tree near the mere at Scarbro', Sept., 1856, John Nowell. On willows with *T. latifolia*, Sowerby Ings, near Thirsk, 1857, J. H. D.

Hypnum irriguum, H. & W.: North Yorkshire. Some time back Mr. Wilson wrote to me that he had found some fragments of this moss intermixed with examples of *H. radiale*, which I had sent him from the Holmes, near Thirsk, but I have not since been able to find it there. Subsequently Mr. Baker ascertained that specimens which he had collected on the north side of the Yore at Tanfield, belong to this species; and that

the moss recorded as *H. ochraceum* in "Suppl. Flo. Yorks.," from "stones in the Swale, below Topcliffe Bridge" should be referred here.

Hypnum ochraceum, Turn.: North Yorkshire. In the small stream that descends from Easterside to the Rye, at Laskill Bilsdale, 1856, J. G. Baker. New to the riding, vide Supra.

Hypnum exanulatum, Bryol. Eur., *H. aduncum*, Bryol. Brit.: Lancashire. Wet places in Cliviger, 1853, John Nowell. West Yorkshire; bogs at Widdop, near Heptonstall, 1855, and in a small bog at Fell Beck, near Pateley Bridge, with young fruit, April, 1854, John Nowell. Cottingley moor, near Bingley, Dr. Carrington. At an elevation of about five hundred yards on the south-eastern slope of Ingleborough, near Gaping Gill Hole, 1855, J. G. Baker. I believe that this species has not yet been ascertained to occur in the North Riding. It is certainly not common in the county, as stated in "Suppl. Flo. Yorks.," so that it is probable that *H. aduncum*, H. & J., (*H. commutatum*, var. *condensatum*, Wils.) was confused with it.

Orthotrichum phyllanthum, B. & S.: Kincardineshire, Laurencekirk, 1854. A. Hutton. North Yorkshire; trees near Ingleby Greenhow, 1856, W. Mudd. Thorns at Mill Bay, near Scarbro', John Nowell. Specimens collected by Mr. A. O. Black, in Forge Valley, appear also to belong to this species.

Mr. H. Ibbotson exhibited specimens of *Apera spica-venti* from two new north-east Yorkshire stations, observed by himself last summer, namely, cultivated fields at Suett Carr, near Sutton-on-the-Forest, (in the neighbourhood of the locality recorded by Archdeacon Peirson, in the "Original Botanist's Guide,") and at Catton, near Topcliffe.

The Querist.

In "The Lady of the Lake" occurs the following:—

"A feeble and a timorous guest,
The fieldfare framed her lowly nest."

I have great confidence in Sir Walter Scott as an observer of Nature—no naturalist can read the "Lady of the Lake," for instance, without; but is he not mistaken here as to the fieldfare's nesting, in Scotland even? I am aware that some few instances have occurred of its breeding in this country. But, again, in the same poem—

"Like summer rose,
That brighter in the dew-drop glows."

I profess myself no poet, and cannot say how far "poetic license" may lawfully extend, but is it not the case that the dew-drop glows or glistens in the rose, rather than the rose in the dew-drop?—F. O. MORRIS, Nunburnholme Rectory, December 11th., 1857.



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BY C. R. BREE, ESQ.

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the earth is full of Thy riches.—PSALM civ., 24.

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THE question of Double-broodedness in the Lepidoptera, will be opened next month, when our friends Mr. Greene and Mr. Crewe take opposite sides of the question. We invite the attention of Entomologists to this subject; rendered still more interesting by M. Guenée's remarks; which, instead of setting the matter at rest, have only given it more clearly-defined limits. The question to be settled is whether some of the Lepidoptera are double-brooded *as a natural law* or not;—not whether climate and latitude affect the disclosure of the insect, which is a fact not in dispute among practical Entomologists.—ED.

*** All communications on Entomology intended for insertion in this department of "The Naturalist," must be sent before the 15th. of the month to C. R. BREE, Esq., *Stowmarket, Suffolk.*

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CHARACTERISTICS OF COMMON BIRDS.

BY O. S. ROUND, ESQ.

(Continued from page 30.)



BESIDES those birds which are commonly about our path, as we wander in the country, or even make the more limited tour of our garden, there are others no less common, which we must, however, go somewhat out of our way to see, and whose home is removed from the ordinary haunts of men; and perhaps this observation chiefly applies to the waders and Ducks, although there are also denizens of the moor of whom it is equally true. Almost the earliest remembrance I have of studying the habits of the feathered tribes is connected with the solitude of the secluded brook or lonely pool, those quiet unmolested nooks which one comes upon occasionally in large covers, either formed by the nature of the ground, and thus hollows filled with water, from the situation of their levels, or enlarged portions of brooks that steal along in sinuous ways amongst the depths of the wood. If these be extensive, that is, covering an acre or two in extent, as is sometimes the case, when we suddenly come upon them it is not uncommon to hear a splash, and see the rings in the water's surface, arising from the sudden displacement of a portion of the fluid by the plunging in of some object—it may be a rat, you think—perhaps it is, but if you sit yourself down amongst the bushes, and keep quiet for a short time, you will perceive a dark object stealing gently out of the thick rushes or flags, and a small black head, for you seldom see much more, is soon disclosed, and almost simultaneously some two or three more appear in different parts of the pond, generally near the edge, or out of the thickest of the weeds; if you still remain quiet, a little more of the objects is seen, for they are sufficiently cautious, and the identity of the Dabchick, or Little Grebe, (*Podiceps minor*), is complete.

These little creatures are as amphibious as the Otter, (*Lutra vulgaris*), and are covered with such a thick coat of oily plumage and down, that they have only to shake themselves to be dry enough; not that I ever saw them out of their native element except when shot, and then they were as dry the next moment, except perhaps near the vent, as if they had been hay-making.

The male is sometimes of a very rich sienna brown, and always, I should say, smaller than the female; and their feet are, as is well known, of a peculiar construction, that is, palmated and admirably formed for natation; although like those of the Divers, (*Colymbi*), they fold up quite flatly when drawn back to take the stroke. How they manage on land I cannot speak so particularly, as all I have seen them execute in this

particular, is a crawling in the long herbage at the margin of the water, although I should imagine from their shape and the position of the feet, they are capable of standing erect, after the manner of the Penguins.

On the occasions above referred to, I perceived that the young of the Moor-Hen, (*Gallinula chloropus*,) might be easily confounded with the Dabchicks, but if seen near, of course the length of the leg at once distinguished them. In these situations it is not uncommon for the Teal, (*Anas crecca*,) to find a retreat with its tiny brood, for Gilbert White well designates them as "minute yet well-fledged wild-fowls." It would seem that the smaller ducks either get the feathers sooner, or arrive at that stage of existence when they become fully plumed, long before they attain anything like full growth, and this is probably a provision for their preservation, in the same way that all wild animals are more precocious than tame ones. Young ducks, however, are pretty well protected during their non-age, by the situations in which they are bred, and I have found it extremely difficult to see them, although I knew that I ought to do so, from their extreme similarity to the decayed water-plants amongst which they were. This difficulty of distinguishing wild animals from the surrounding herbage, is wonderfully exemplified in the Snipe, (*Scolopax*;) and I remember when a boy, sharp-eyed as I was, being continually unable to see them sitting just before a staunch old pointer, by whose movements I always knew that her game was not far off. I did indeed on one occasion catch a Snipe, (*Scolopax gallinago*,) before her nose; and a friend of mine knocked down and bagged a Jack Snipe, (*Scolopax gallinula*,) with a small horse-whip, his dog pointing it by the road-side as he was out riding.

The Woodcock also is remarkable in this particular, and is I suppose the most difficult creature to see amongst the dead fern-brakes which he almost always chooses to sit in. These birds are difficult to shoot, because they are very quick and uncertain in their flight, and I have heard a friend of mine often relate a splendid double shot made by his uncle, who is a dead shot, at two Woodcocks which they flushed in a thick wood; one went almost straight upwards through the thick branches, but although lost to sight, the fatal charge followed so unerringly through stick and leaf in the direction he was going, that down he came amidst a shower of twigs and leaves. The other meanwhile cut in and out amongst the stems of the trees, but, alas! these were equally insufficient to shield *him*, and the opportunity seized of a glimpse between two stems, brought him also to earth at a long shot.

I took some pains at one time to obtain good evidence on the subject of the Great Snipe, (*Scolopax major*,) and compared notes with many professed Snipe-shots who had spent their lives in the bogs, but could

never make out clearly that they had ever obtained a specimen, although this perhaps is not at all conclusive, or going to prove that they had not shot such a bird, when we consider the carelessness of preserving specimens which is always observable amongst real sportsmen who are not naturalists. This I have seen often instanced by drawing the attention of such men to the subject, by begging for the first clean-killed bird they got, and this at once produced something worth having, which would doubtless otherwise have been crammed in amongst a congeries worthy of a battle-field, and so made unpresentable and unpreservable; but I quite excuse this, for even with the greatest care, it is difficult to prevent the feathers getting hurt; the best thing I know of is a sheet of cotton wool, which weighs nothing, and an old silk handkerchief, first plugging the throat and nostrils with the wool, and wrapping the bird in it and then in the handkerchief, it cannot come to much harm.

Snipes, the Heather-bleater or Whole Snipe, breed a good deal in the southern counties of England, more indeed I am confident than people generally imagine; I am speaking now of those localities which are in summer comparatively deserted by them; for their habits are quiet and their nesting recondite; but an old man whom I knew in old times, and who was a regular peat-cutter and bog-trotter, often discovered their nests, and brought me the eggs, which bore a great resemblance to those of the Lapwing, (*Vanellus cristatus*), and not very inferior in size;* in fact, unexpectedly large for the size of the bird.

The Jack Snipe, (*Scolopax gallinula*), arrives in the autumn in the inland bogs with great regularity; and I remember my brother remarking that on the same day in each year, (it was, I think, the 19th. of September,) he always first saw and generally shot a Jack Snipe, which did not last him the autumn to pop at, as it is said to do some people.

Quails, (*Coturnix vulgaris*), are very uncertain in their visits, and can hardly be regarded as common birds in England. I have found them in all parts of the country—on the heath, in cover, and in the stubble, and always singly, although I remember a gentleman shooting two brace in one day, in the parish of Langley, Bucks., not far from Uxbridge. They have much the appearance of a Squeaker, or very young Partridge. I have often seen them for sale in Hungerford Market, London, both dead and alive, the latter, no doubt, an importation from the continent.

I find that I have so much still to say on this general subject, that I must conclude for the present.

Pembroke Square, Kensington, January, 1857.

(To be continued.)

* This is quite a mistake.—F. O. MORRIS.

THE LINCOLNSHIRE COAST.

BY F. M. BURTON, ESQ.

IN the early part of last August I visited several places on this coast, with a view to naturalizing, and as so few, who can make their choice, ever think of going to so barren a locality, a short account of its products may not be uninteresting.

At Mablethorpe, about seven miles from Alford, I found several shells in great abundance, such as *Tellina solidula*, *Syndosmya alba*, *Macra Stultorum*, and *Solen siliqua*. They inhabit sand and mud at low water, and the several species are easily distinguished by the different marks they make in the sand. The burrow of *Tellina solidula* is always indicated by a small track from three to four inches long, as if cut by a blunt knife, at one end of which it may invariably be found buried. That of *Syndosmya alba* is usually a slight eminence under which it lies. *Macra Stultorum* buries itself from four to eight inches deep, and makes a small hole in the sand, about the size of a pea, out of which it sometimes protrudes its siphon; while the common Razor Shell, (*Solen siliqua*), bores down sometimes to the depth of two feet or more, and is easily discovered by a hole about as big as a bullet, round which may generally be observed the marks of the drops of water it has lately spouted up. Besides these I found *Syndosmya prismatica* not uncommon, and a few *Syndosmya intermedia*, also *Tellina tenuis*, *Solen pellucidus*, *Macra elliptica*, *Nucula nucleus* and *radiata*, *Velutina lævigata*, *Trophon clathratus*, *Donax anatinus*, *Cylichna obtusa*, *Cardium pygmæum*, *Artemis exoleta*, *Pholas candida*, and enormous single valves of *Pholas crispata*; the white variety of *Pecten varius*, *P. tigrinus*, and *Mya truncata*, besides species of the genera *Trochus*, *Natica*, *Nassa*, and others. Sea-weeds and zoophytes were scarce. The common *Flustra foliacea* sometimes came up in the dredge, which was remarkable for having no scent, a quality which I have found it invariably to possess elsewhere when alive.

Vast quantities of *Acalephæ* were floating about; the *Rhizostomæ*, conspicuous for their rich purple tinge, and each retiring tide left numbers a prey to the little hopping scavenger *Talitrus locusta*, which swarmed at high-water mark. The star-fishes were represented by the common *Uraster rubens*, *Solaster papposa*, *Echinus sphaera*, and *Amphidotus caudatus*, and the only interesting specimen I found among the Crustacea was *Sulcator arenarius*, and it was rather abundant on sandy ridges laid bare at low water, lying in a little hollow just big enough for its body; and to judge from the number of empty holes, and the quantity of feathered footprints round them, it is evidently esteemed a delicacy by Ring Dotterels and other shore birds.

Cleethorpes, at the mouth of the Humber, I also visited, intending to dredge there, but as oyster-catching is the staple fishing of the place, I tried in vain to get a boat. The men could not understand my going out for anything but oysters, and that they did not like, so I was forced to content myself with the shore, and rely on their promises to bring me back all they could find. Most of the inhabitants of the place are brought up to this kind of life, and at the beginning of every week they set off, returning at the latter end of it, when each boat-load is shot out on a separate tract of ground marked out with tall stakes, visible at high water, and for which they pay a rent of ten shillings an acre. The oysters are measured off in tubs, each of which contains about a thousand, and is worth twenty shillings. The boys, before they are old enough to dredge, gather cockles on the shore, which they sell for one shilling a peck.

The oyster-beds are laid bare at spring tides, and an opportunity now occurring, I walked down for the double purpose of seeing them, and to collect whatever shells might be uncovered at low water.

Trochus cinerarius and *umbilicatus* and *Chiton cinereus* were abundant; I found also some remarkably fine foliated specimens of *Purpura lapillus*, and at high-water mark *Trochus tumidus*, *Mangelia rufa*, *Lacuna crassior*, *Led-caudata*, *Fusus antiquus*, *Cypræa Europæa*, *Buccinum undatum*, *Scrobicularia piperata*, and several others. On this part of the coast there are large marshy tracts of ground, called Fitties, fretted with little salt pools, and covered with a vegetation of thrift, sea lavender, and other marine plants, over which the sea flows at high spring tides, forming a great resort of wild-fowl, both for breeding and in the winter season. Every hole and pool here I found filled with the little *Rissoa ulvæ*. They especially frequent the ground where it is damp, crawling over the slime, and clinging to every dead shell and refuse weed. The more marshy parts of the Fitties abounded with Redshanks, Ducks, and sea-birds of many kinds. The Common and Lesser Terns were especially abundant; some of them kept continually wheeling about above me, with their incessant whistling scream, now and then darting down with great rapidity to within a few feet of my head. The Lesser Black-backed Gulls stood solemnly and stiffly on the little eminences of sand, and took to flight long before I got near them. The Oyster-catchers flew backwards and forwards in small flocks, keeping in a line like Ducks, and settling as far out to sea as possible, wherever the retiring tide left the ridges of brown sand bare, while countless clouds of Dunlins and Sandpipers swept along the coast.

The Oyster-catchers may sometimes be seen in immense flocks on our flat muddy shores. I remember once at Hunstanton, on the Norfolk side of the Wash, sitting on the cliff for upwards of an hour, as the evening was coming on, and watching these birds returning from feeding on the

marshes near Lynn; flock after flock went past, and as some of these living lines, to judge from appearance, were certainly not less than a mile in length, some idea may be formed of their prodigious number.

The lower part of the Fitties, which appeared at a distance of a bright green colour, was covered with the jointed glass wort, *Salicornea herbacea*, which is there gathered for samphire, and used for pickle. Each little plant was covered by black crawling *Ulvæ*; some of them so thickly, as to present the appearance given to the tops of broad beans and other plants when infested by the black *aphis*. In fact these little insignificant molluscs actually gave a colour to the ground for miles, so very abundant were they, and the shore was strewn everywhere with their dead shells. Outside the marshes, left dry by the spring tides, I found a quantity of *Syndosmya tenuis* and *Cylichna obtusa*, and a good deal of drift wood, bored by *Pholas crispata*, several of whose shells I got out entire, and in fair condition. These specimens were of the usual size, not half so large as the single valves picked up at Mablethorpe, a variety I have also met with at Hunstanton, but a double specimen of which I have never yet seen.

Uppingham, Rutland, October 14th., 1857.

NATURAL HISTORY OF NUNBURNHOLME.

BY THE REV. F. O. MORRIS, B.A.

(Continued from Vol. vii., page 271.)

THE Rectory House stands a little out of the village, westerly, near the middle of one side of the glebe land, which consists of about ninety acres, in the form of a square, with the exception, or addition, of one small square field behind it. Two kitchen-gardens and the flower-garden, with the churchyard, the latter a small square north of the house, give the same form of a square to the whole of the premises, if taken in connection with it on one side, and with a small orchard on the other, towards the south.

In the first instance I intend to speak of the different birds, beasts, plants, fishes, reptiles, and insects, which we have noticed in and about our own flower-garden, etc., that is to say the square plot just spoken of, close to the house, and afterwards of the productions of the remainder of the parish. I am almost surprised myself when I think how much so small a space has produced; but, in the first place, when wild creatures are not disturbed, but encouraged, and, in the second place, when people use their eyes to observe them, they will see more things than are "dreamt of" by those who have no sight but for the glaring objects which please an acquired and unnatural taste.

But our flower-garden—now our flower-garden is the prettiest flower-garden in England—to my taste, at least. I will endeavour first to describe it to you: no, I will not do so at once, but bit by bit, in connection with the several species which give to each separate part a never-failing pleasure of association. I shall, then, in the first instance, I repeat, give an account of the birds, beasts, insects, plants, fishes, etc., found, and to be found, within the narrow limits of the Rectory garden, and shall then enlarge, widening out from this centre of the parish, like the circle caused by the stone thrown into the lake, on the productions of the parish itself. Fishes! you say, what fishes can you have in a Rectory garden? Why, my good friend, the great ornament of our garden is a running stream which winds all along one side of it, in view of several of the windows of the house. The house! yes, an idea just occurs to me; I have a sketch of the house made by a friend, and a very good likeness it is, and you shall have a fac-simile of it, so that you shall see, as it were, before your eyes the residence of the author of the “British Birds,” any one but the “Great Unknown.” Author, indeed! who would have ever thought of my becoming an author, and one so favourably received too, by the public! Excuse, good reader, the passing feeling of satisfaction, nay, not passing, it is one which will be a gratification to me as long as I live. Who would have thought that my fondness for “Nature” in my school-days, and my then untiring hunts after birds and butterflies, should have led to such an unexpected result!

But stop! I said in brief that the Rectory I have and hold is one exactly suited to me, and myself, in some degree, I would hope, to it, and now further to shew this, as how desirably situated it is for my convenience, comfort, and happiness in various ways, it has occurred to me that I may here make a digression, from which, not after the manner of Tristram Shandy, I shall duly return, and first give a short account of my birth, parentage, and education:—before going on about the place, why not say something of the person? If I have been right in supposing that my readers may take an interest in seeing what my residence is like, why may it not be supposed that he who dwells in it may, albeit that he owes the distinction of his position as a successful author, far more, he feels, to the kindness of his readers than to his own merits, come in for a share of the like curiosity?

May it please you then, ladies and gentlemen; I was born (I will be as brief as possible) on Lady Day, March 25th., 1810, and was married on New Year's Day, 1835. My great great grandfather, Owen Morris, was of Welsh, that is of Ancient British descent, the original stock of the country before Saxon, Dane, or Norman had set foot on the island, and we still bear the arms of Elystan Glodrydd, founder of the Fourth Royal Tribe of Wales, quarterly with those of his son Cadwgan, or Cadogan.

But to come somewhat nearer home, to shew, as I have already mentioned, how desirably situated the Rectory of Nunburnholme was and is for me, and how that in the words of Sir Walter Scott, in the preface to "Marmion," speaking of his then residence at Ashestiel, "according to the heartfelt phrase of Scripture, we 'dwelt among our own people,' and as the distance from the metropolis was only thirty miles, we were not out of reach of our friends."

My grandfather, Lieutenant-Colonel Roger Morris, lived at York, and some of my oldest and most pleasant remembrances are associated with the ancient city, which is only some sixteen miles from me on one side, with a railway all the way from our station a mile and a quarter off. In another direction I am only some two dozen miles from Burlington Quay, with a railway for half the distance, where reside my mother, brother, and two sisters. In another, fifteen from Hutton, near Malton, where lies my principal landed property—not so large as I could wish. In yet another, thirty-six miles, by railway all the way, from Ripon, in the West Riding, where I have a married sister living, (as was another in the opposite direction, at Hull, but since removed,) in which division of the county an uncle, Commander Amherst Morris, R.N., formerly lived at Baildon, near Bingley. So again, first cousins, and first cousins once removed, near Thirsk and Bedale, in the North Riding. And, lastly, about thirteen miles from Beverley, the county town of the East Riding, with a railway for the first four miles, where lie the remains, in the Minster churchyard, of my father, the late Rear Admiral Henry Gage Morris, R. N.

I happened to attend the last sessions but one at Beverley, and took the opportunity of walking down to visit my poor father's grave. There was already a person, a stranger to me in the churchyard, and to my somewhat surprise he was standing on my father's tomb. I went there myself, but made no remark: after a while he said, "Ah sir, this was a most remarkable funeral!" I did not enlighten him as to who I was, and asked for an explanation, though I knew beforehand what he would say. "Sir," he said, "the gentleman who lies here was borne to the grave by his own six sons!" I then said, "I know it—I was one of them, the eldest." Forgive, good reader, the tributary memorial.

But now to proceed to the matter in hand. It is, I believe, generally considered to be the fact, and is indeed no doubt the fact, that the ownership of any land extends downwards as far as the centre of the earth. That is to say, that you have a right to dig and to delve as you please to that depth, in search of buried treasures or the Philosopher's Stone. By parity of reasoning I conceive that you have a right to all that is above you, as far as you can go to claim it, or can reach by the help

of scientific means. This being the case, I begin my Natural History with the Wild Goose, which may often be seen up above over our heads flying back in the early dusk of the evening to the Humber, or some water, after having fed during the day among the stubbles on the Wolds. I conjecture that the species is the Pink-footed Goose, (*Anser brachyrhyncus*), for not only was the only one that has been brought to me, having been shot, of this kind, but I think there is reason to believe that most of the flocks we see are the same. Indeed, Mr. Arthur Strickland, in letters to me, contends that this is the—the only—common or commonly supposed common species; and that the so-called Common Wild Goose is, if not purely apocryphal, a very rare bird.

(To be continued.)

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 39.)

31. *E. lanestris*.—Very abundant in the neighbourhood of Brandeston, the hedges being quite full of the large, tough, glutinous webs spun by the larvæ. The cocoön (like the egg of a small bird) is well deserving of attention, and is quite a pretty object. The insect remains in the pupa state for apparently any length of time without dying. I have had them three years myself; and I learn from a correspondent that he has had them as long as nine!

32. *T. cratagi*.—Rare. A few larvæ taken at Playford. I think the best way to find it is to examine the hawthorn hedges with a lantern in May and June.

N.B.—The larva of this insect is polyphagous. I have seen it upon birch, hazel, hawthorn, and crab. It is very fond of sunning itself. The egg is laid in the autumn, and does not hatch till spring. It is of a rich chesnut colour, paler at the base, which is flattened. When looked at through a glass it reminds one very much of a ripe acorn. It is covered with the down of the parent moth. For the eggs, from which the description and that of *L. monacha* are taken, I am indebted to the kindness of Mr. Rodgers, of Rotherham. (C.)

33. *P. populi*.—Common. The larva of this insect varies much in size and appearance. It is flat and depressed, lying at full length upon the trunks

and branches of trees, to which it clings with great tenacity. It closely resembles the larva of *C. nupta* (though of course much smaller) in its habits and appearance. It seems to be polyphagous. The perfect insect is a very strong and active flyer, and soon injures itself.

N.B.—The larva of this insect may at once be recognised by its orange belly. It will feed on almost any tree. I have myself taken it upon birch, elm, alder, hawthorn, willow, and oak. In confinement it requires plenty of air, and is very apt to die when changing its skin. The egg is clay-coloured, spotted with black, and having a black spot encircled by a white ring at the base. When first hatched the young larva will feed freely upon the young leaves of the hawthorn. (C.)

34. *L. rubi*.—Extremely common in the larva state on Kesgrave heath. It (the larva) hibernates, as is well known. Vast numbers must fall a prey to ichneumons, as I did not observe a single specimen on the wing, and all the larvæ I kept produced a dipterous insect, each containing from four to six of them.

35. *L. quercus*.—Also common. The larva appears willing to feed on anything and everything. I have even found it on laurel.

36. *L. callunæ*.—As I quite agree with Mr. Weaver, in considering this a distinct insect, I am happy to be able to enumerate it among the Lepidoptera of Suffolk. I met with *one* larva only, at Brandeston. It was taken the first week in June, 1855, having evidently hibernated. It was then about two inches in length, slender, greyish brown, with blue rings, and very hairy. It was full fed by the end of that month, and the perfect insect did not appear till the end of the July in the following year, having been thirteen months in the pupa state. It was a male, and did not differ much in appearance from *Quercus*, excepting that it was much more richly coloured. At page 113 of the "Substitute," is a communication from me on this subject, which I am ashamed to say, abounds with mistakes, and I am anxious to correct them here. I there state that the larva of *Quercus* turned to a pupa at the end of August. I should have said that the insect emerged from the pupa at that time. How I could have made this blunder, I cannot conceive. There are also several inaccuracies in that communication respecting the larva of *Callunæ*. I need not enumerate them here, as the statement given above will be sufficient to set them right. Now, unless I am greatly mistaken, *Quercus* completes its transformations, in England at least, in twelve months, that is, the eggs are hatched in the autumn, the larvæ hibernate, spin up at the end of June, and the perfect insect appears in July and August. But, not to mention the difference in the larvæ, *Callunæ* requires exactly double that period to arrive at maturity, remaining a whole year in the pupa state alone. When Mr. Weaver first broached the idea, that his Scotch specimens were a distinct species, it was answered, I believe, that the difference of climate and soil sufficiently accounted for the variation in the habits and appearance of the insect in its different stages. That the habits of the same species will often be very dissimilar in Scotland to what they are in England, no one will deny. In proof of this I may mention the following circumstance:—Not long since that intelligent and accurate Entomologist, Mr. Chapman, of Glasgow, wrote

to me, saying, that he thought I erred in asserting that Mr. Stainton had made a mistake in making the larva of *Flavicornis* occur in September; (Manual, page 176,) adding, that he himself always took it in that month, or in August. Now, adhering as I do, to my former statement, that, in England, the larva is found in June, and never in the autumn, we can only explain this difference by the difference of climate, and, in this instance the explanation is sufficient. But clearly it does not apply to the case of *Quercus* and *Callunæ*. Were this latter (call it a variety, or whatever you please,) confined to Scotland, the answer about climate, etc., might suffice. But it is *not*, having been taken in Suffolk, and also, I understand, in Cornwall; and I think there cannot be much in common between Scotland and Cornwall. I am afraid I shall have appeared tedious to some, in writing at such length upon this subject, but I really think that the matter ought to be decided one way or the other; and if it be settled that *Callunæ* is a species, let us give the honour to whom it is due—that indefatigable collector, Richard Weaver.*

N.B.—I strongly incline to the opinion that this insect is only a variety of *Quercus*. Certainly the difference in shade of colour does not give it a right to specific distinction, or we should at once, upon the same grounds, give the same rank to the varieties of such species as *Angerona prunaria*, or *Hibernia defoliaria*. I have one well-marked ♀ of this so-called species, but I have seen a great many of both sexes in which the difference in markings certainly was not sufficient to constitute a distinct species. Mr. Greene's remarks about the difference in time of the metamorphosis are however interesting, and I think deserve the attention of collectors. I quite join in Mr. Greene's wish to give all honour to a well-known collector and indefatigable naturalist like Mr. Weaver; but claims like these must never induce us to commit ourselves to endorse the too common inclination of almost all naturalists to establish specific distinction, without the strongest and most indisputable proof. (B.)†

I cannot yet convince myself that both the supposed larva and perfect insect of this so-called distinct species are not varieties of *L. quercus*. I, like my friend Mr. Bree, had an opportunity the other day of seeing a long series of both ♂ and ♀ which had been bred this season in Scotland; and had I not been previously told that they were *L. callunæ*, I could never have supposed them to be anything but *L. quercus*, as in many of them there was not the slightest apparent difference. The larva of *L. quercus* not unfrequently goes on feeding till July or August, and in this case the perfect insect does not appear till the corresponding month of the following year. Those larvæ also which spin up at the end of June, sometimes remain more than twelve months in the pupa state. I can vouch for both these facts from my own experience. I have now before me on the table, (Dec. 30th.,) a very lively pupa, the larva of which spun up at the end of June. It appears to me, therefore, that the

* The above communication from Mr. Greene reached me before the appearance of Mr. Harding's paper in the "Zoologist."—ED.

† Since the above was written, intelligence has reached us of the death of Mr. Weaver—an event which all British Naturalists will deplore.—ED.

length of time which the supposed larva of *L. calluna* remains in the pupa state, is no proof of its being a distinct species. If any Entomologist will tell me, that from a batch of eggs laid by a ♀ *L. calluna*, he has raised a brood of larvæ, *all* of them having *blue* rings, and *all* of them remaining twelve or thirteen months in the pupa state, I shall then feel inclined to believe that it is a distinct species; but till then I must, I fear, remain, if not an unbeliever, at any rate a sceptic. (C.) *

37. *O. potatoria*.—Very abundant of course. The larva hibernates.

38. *S. carpini*.—Common on Kesgrave heath, where I not unfrequently found the balloon-shaped cocoons attached to the heather.

39. *E. versicolor*.—Though not fortunate enough to meet with this insect myself, I feel assured that it must occur at Kesgrave.

40. *C. ligniperda*.—Common in the larva state. Its presence, when very young at any rate, can easily be detected by the frass. There was a poor, old, solitary hawthorn in a field near Playford, the trunk of which was quite riddled by them, and upon removing the bark the young larvæ, varying in size from half to one inch, were to be seen snugly coiled up, in preparation for the wintry season. Do they *feed* during the winter? It has always struck me as very wonderful, how short a time suffices to bring this large insect to maturity, when it has once changed to a pupa, bearing in mind that the larva requires three years to attain to its full growth.

41. *Z. Æsculi*.—One larva at Brandeston, but it unfortunately did not live.

42. *Hepialus humuli*.—Common.

43. *H. lupulinus*.—Very abundant.

44. *H. sylvinus*.—Not uncommon in my neighbourhood. (B.)

45. *H. hectus*.—Very common in woods near Stowmarket. (B.)

46. *L. testudo*.—Very rare. One beaten from oak at Playford.

N.B.—This insect appears the last week in June and the beginning of July. It is not uncommon in the Kentish woods. The best way to get it is to beat the low boughs of the oaks into an umbrella. The moth falls and shams death. It must either be pinned or put into the chloroform or laurel-leaf box at once, for as soon as it is touched it begins jumping about like a parched pea, and soon utterly ruins its appearance. It is no use whatever putting it into a pill-box. (C.)

47. *C. spinula*.—Very abundant. This pretty little insect is very partial to light, and on entering the room almost immediately attaches itself to the window-pane, where it will remain immoveable for hours, with its wings folded just like the roof of a house.

N.B.—This insect is double-brooded, appearing in May and again towards the end of July and beginning of August. I have beaten its singular-shaped reddish brown larva off hawthorn, mountain-ash, and alder, in September and October. (C.)

* Since writing the above, I have read Mr. Harding's paper in the December "Zoologist;" but with all due deference to his well-known experience, the claim of *L. calluna* does not appear to me to be yet clearly established.

(To be continued.)

Honesty and Dishonesty.—I read an article in the "Zoologist" of last year written by you, and as I fear much mistrust has gone abroad, will trouble you with one or two remarks. This is a very bad feeling to cherish in society of any kind, and I believe a great drawback to science. I long to see each collector, rich or poor, working hand in hand, without that selfishness that you would have seen prevalent at Lewes last season, when thirteen collectors, all on one spot after *Empyrea*, were running over each other, and caught looking at each other's sugar, which was not pleasant to the feelings; and it is that which gives distrust. Dishonesty has all its weapons of warfare. Then these collectors call on seven or thirty persons, as the case may be, and they do not tell the same tale to all; so when their customers meet, they compare each other's story as told, and alas! too often find something wrong. This creates suspicion, and I suppose those whose corns have been trodden on, feel they have a right to speak out freely. This I do not blame, for if I had any suspicion any insect I had from a friend was not British, I would crush it directly. My sole object in writing to you is to give a practical hint as to the necessity of gentlemen helping poor men, who are striving to obtain their bread by capturing insects, so long as they are honest; and when found out in dishonesty, then let them be exposed in public works. I give you an instance of my own experience while in pursuit of knowledge under difficulties. I hope any digression will be overlooked, as I want nothing but to shew that working men have done something for cabinets. In 1853, I captured one hundred and thirty *Diptera orion* near Ipswich. June 8th. took one, three next night, twenty-six next, seven next, twenty-seven next, and so on till the end of June. Wind, south, was at all times most favourable. I took *S. conspicuaria* at Raydon Wood in 1851. I saw one *V. antiopa* feeding on sugar with *atalanta* in the centre of Raydon Wood; it glided on to the end of the wood, and then settled on a gate-post, from which it flew off above the oaks. A week after that my friend Mr. C. Eaton took one on Nacton Heath at sugar—this is important. I have taken *G. c-album* on Nacton Heath, as well as *N. sener*. I have taken *C. ridens* at light in April, by hanging up a sheet in Bentley Wood. I have taken *P. dysodea* near Ipswich. The *Athalia* which you reported my having taken in Suffolk, I beg to tell you now I took at Maldon Wood, in Essex—about two hundred that year. I brought home several in muslin, and turned them out at Clubs Heath as I went home to Ipswich, and they have since been taken there in great numbers.—GEORGE KING, 85, Lower Union Street, Torquay.

[We can assure Mr. King that honest men, however poor, will at all times receive the utmost encouragement and assistance we can afford them. The dishonest trader in insects however, whether rich or poor, will ever find us his most uncompromising enemy. We will have no communication, or hold any terms with men who commit the fraud of imposing foreign insects upon their customers for British specimens. No amount of pleading, for bread even, shall induce us to swerve from this course. We hold it to be the duty of every man who lays claim to the character of scientific, to assist us in the performance of this duty. English collections as such are becoming tainted with that

suspicion, which, if not checked, will destroy their character as truthful representatives of a British Fauna. Those who commit these frauds must see that there can ultimately be but one result, viz., a union of all honest collectors, for the purpose of exchanging British species, with an annual subscription sufficient to cover all expenses, and a stringent rule to purchase no insects at all.—ED.]

C. Hippothoe.—I thank you for your kind hint respecting the notice of Mr. Crewe, which I beg you the favour to answer, as it was quite an omission and mistake of Mr. Edward Newman. I went to his office, and showed him the five old *Dispars* collected many years ago, by an excellent old collector who is now dead; captured on Whittlesea Mere. Mr. Garrod saw them when I was in Ipswich; I had not got them when I called on you. I know of a person in the fen who reported that he took one hundred and fifty in the year 1856. I believe the other insects were collected by me this year. It would injure me much to let this mistake in the name go uncorrected. I see Linnaeus called *Dispar Hippothoe* according to Mr. Doubleday's list. I wish you to thank Mr. Crewe for his kindness.—GEORGE KING, 85, Lower Union-Street, Torquay.

T. fimbria.—It seems to be the popular idea that the larva of *Triphæna fimbria* feeds exclusively upon *primrose*. Now this, like most other democratic opinions, is wrong. Two years since my old friend Mr. Hawker and myself took at least fifty of this larva, by lantern-light in April and May. In no one single instance did we find them feeding upon *primrose*, (though the woods were full of it,) or upon any low-growing plant. They were always upon the underwood, from two to four feet from the ground, and fed indiscriminately upon white-thorn, black-thorn, beech, hazel, sallow, and sometimes upon dogwood. In the day-time this larva conceals itself upon the ground, and no doubt often selects the overshadowing leaves of the *primrose*, foxglove, etc., for its hiding-place. I have known a specimen reared upon the latter plant; and I think it most probable that it also occasionally feeds upon *primrose*, but certainly as far as my own experience goes, it prefers the undergrowth of trees and shrubs. The best time for larva-hunting by lantern-light is from eight to ten o'clock, p.m.; and on a fine warm evening, from the middle of April to the middle of May, it is most exciting work for an Entomologist.—H. HARPUR CREWE, Stowmarket, February 13th., 1858.

Bostrichus bispinus.—I have obtained lately above fifty specimens of both sexes of this insect from the Traveller's Joy, *Clematis vitalba*, which I have collected in this neighbourhood; so that it would appear to be abundantly distributed wherever the *Clematis* is found. They may be detected by observing the stems which are pierced, and are generally found near the joints.—W. C. UNWIN, St. Anns, Lewes, February 11th., 1858.

Lithosia at sugar.—I have often met with *L. complanula* and *griseola* at sugar. At Darenth Wood, last July, I took about a dozen specimens of *L. miniata* at sugar, besides several others flying. I mention this fact as there

seems great doubt whether the *Lithosidæ* are attracted by sugar or not.—E. G. BALDWIN, Albany House, Barnsbury Park, Feb. 8th., 1858.

Do the Bombyces feed at sugar?—Upon this subject we beg to copy the following from a letter with which we have been favoured by Mr. H. Doubleday. There is certainly no anatomical reason why the *Lithosiæ* should not feed, as they have a spiral tongue, and the mouth is altogether more developed than in the other genera of this division of Lepidoptera. The fact that they do feed is, we think, now clearly established.—ED.—“I have very frequently seen the *Lithosiæ* at sugar on the trunks of trees—*complanula* and *griseola* in abundance, and *miniata* not unfrequently. I have also seen *C. elpenor* hovering over sugar here; and Mr. English, who went to the fens to collect insects for me, some years since, tells me that it was very plentiful there over the sugar which he put out. I frequently used to sugar the trunks of some young lime trees in the field adjoining our garden, and I have taken *Cossus ligniperda* three or four times on these trees at night; whether the sugar did or did not attract them I cannot say; they were always running about the trunk, but I never saw one at night on a tree that was not sugared, although do doubt they might be found upon willows.”

Bombyces at sugar.—I have been much interested in your papers in “The Naturalist,” with the detailed list of Lepidoptera occurring in Suffolk, which would seem to be a land, entomologically, flowing with milk and honey. I should think your *L. helveola* must have come to the tree on which your gardener took him for the *bona fide* purpose of regaling himself on the “sugar.” I have repeatedly taken both *G. rubricollis* and *L. griseola*, the latter in extreme profusion, at sugar in Cambridgeshire; and with respect to *C. ligniperda*, a friend of mine, Mr. Bostock, has, and on more than one occasion, taken both it and *Charocampa elpenor* at sugar. I one evening took a fine *L. stramineola* on a spray of black-thorn not six inches from a sugared tree; and from the stupid manner in which he allowed himself to be easily boxed, I am induced to believe that he had already paid a visit to the intoxicating sweets close by him.—MURRAY A. MATHEWS, Raleigh, near Barnstable, February 1st., 1858.

Cambridge Entomological Society.—The first Anniversary Meeting of this Society was held at the Secretary's Rooms, on the evening of Friday, Feb. 5th., 1858. The President, C. C. Babington, Esq., occupied the chair. After the reading of the Minutes, and proposing the names of some new members, J. G. Bonney, Esq. was elected by ballot a Corresponding Member of the Society. The officers of the Society having resigned their respective posts, the same officers were re-elected unanimously to hold the same positions as before, viz., C. C. Babington, M.A., F.R.S., President; J. W. Dunning, B.A., M.E.S., F. Barlow, M.E.S., and T. Brown, Vice-Presidents; A. F. Sealy, M.A., M.E.S., Treasurer and Secretary. A vote of thanks to the several officers was then carried unanimously, for their able conduct during the past year. The President then read his address on the occasion to the members. After a few words of advice concerning the government of the Society, he reviewed the foundation

and progress of the Society, and congratulated the members on its success, the general good attendance, and the very numerous and valuable specimens exhibited during the year. He then pointed out the difference between a mere collector and an Entomologist, urging the one to seek a genuine claim to the title of Naturalist, and encouraging the other to increase his knowledge by the study of books, and more especially by the study of Nature herself. He pointed out the absolute necessity of making the Classification of Insects a study; and, in conclusion, admirably pointed out the evils of bargaining between brother-collectors. "Give," said he, "as liberally as you can; give to all who desire to receive for the purpose of properly using your gifts. There is no higher gratification that you can derive from your collections than thus giving. But avoid at all times the trading spirit which has taken possession of so many Entomologists. Never consider what and how much you are to receive in exchange. Set not insect against insect. Calculate not that one specimen of some species is worth two of some other, or those of a third. You may be sure that the liberal giver will always be the plentiful receiver. Consider only how you may confer pleasure upon your friend, and he will assuredly try to give similar pleasure to you." The President concluded his address by thanking the members for the confidence they shewed in him by re-electing him as President.

A. F. SEALY, HON. SEC.

70, Trumpington Street, Cambridge.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 235, Vol. vii.)

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|--|--|
| Otaria Hauvillii, Cuv. Less. Fisch. | Griff. Pelagius monachus, Fr. Cuv. |
| Schinz. | |
| Otaria coronata, Schinz. Desm. Less. | Phoca vitulinus, Linn. Schinz. P. lit- |
| Fisch. Griff. | torea, Thienem. P. variegata, Nils. |
| Otaria de Lalandii, Cuv. Less. Schinz. | P. scopulicola, Thien. Calocephalus |
| Otaria chilensis, Schinz. Joh. Müller, | vitulinus, Fr. Cuv. |
| Wieg. | Phoca caspica, Nils. Schinz. |
| Otaria Lamarii, Müller, Schinz. | Phoca barbata, Schinz. P. leporina, |
| | Lepesch. P. albigena, Pall. P. |
| | nautica, Pall. Calocephalus barba- |
| | tus, F. Cuv. |
| PHOCA. | |
| Phoca proboscidea, Desm. Schinz. P. | Phoca annellatus, Nils. Schinz. P. |
| leonina, Linn. Fisch. Schreb. P. | equestris, Pall. Calocephalus dis- |
| Ansonii et Coxii, Desm. P. dubia, | color, Fr. Cuv. C. hispidus, Schinz. |
| Fisch. Macrorrhinus proboscideus, | Fr. Cuv. Fisch. |
| Fr. Cuv. Mirounga proboscidea, | Phoca Grœnlandia, Schinz. P. ocean- |
| Griff. Cystophora proboscidea, Nils. | ica, Lep. P. dorsata, Pall. |
| Phoca monachus, Herm. Schinz. P. | Phoca grypus, Schinz. P. ochotensis, |
| albiventer, Bodd. P. bicolor, Shaw. | Pall. P. hispida, Schreb. |
| P. leucogaster, Peron. P. leptonyx. | Phoca lagura, Schinz. P. albicauda, |

- Less. Fisch.* *P. Pilayi*, *Less.* *Calocephalus lagurus*, *Fr. Cuv.*
- Phoca leptonyx*, *Blainv. Schinz.* *P. Homei*, *Less.* *Stenorhynchus leptonyx*, *Fr. Cuv.*
- Phoca Weddellii*, *Schinz.* *Otaria Weddellii*, *Less.*
- Phoca cristatus*, *Schinz.* *P. mitrata*, *Camper.* *P. leucopla*, *Thien.* *Stenmatopus cristatus*, *Fr. Cuv.* *S.*
- mitratus*, *Less.* *Cystophora borealis*, *Nils.*
- Phoca Chorisii*, *Schinz.* *P. tigrina*, *Less.* *P. punctata*, *Encycl. Angl.* *P. maculata*, *Encycl. Angl.*
- Phoca seriaceus*, *Schinz.*
- Phoca testudinea*, *Shaw. Schinz.*
- TRICHECHUS.
- Trichechus Rosmarus*, *Linn. Schreb. Schinz.*

ORDO V.—MARSUPIALIA.

FAMILIA I.—RAPACIA.

THYLACINUS.

- Thylacinus cynocophalus*, *Schinz.* *T. Harrisii*, *Temm.* *Didelphis cyncephala*, *Harris.* *Dasyurus cyncephalus*, *Geoff.*

DASYURUS.

- Dasyurus ursinus*, *Geoff. Tem. Schinz.*
- Didelphys ursinus*, *Harris.* *Sarcophilus ursinus*, *Fr. Cuv. Fisch.*
- Dasyurus macrourus*, *Geoff. Fisch. Schinz.* *Viverra maculata*, *Shaw. Temm. Schreb.*
- Dasyurus Maugei*, *Schinz.* *D. Maugei*

- et D. viverrinus*, *Geoff. Schreb. Tem. Desm. F. Cuv. Fisch.* *D. maculatus*, *Geoff.*

- Dasyurus Geoffroyi*, *Gould. Water. Schinz.*

- Dasyurus hallucatus*, *Gould. Schinz.*

PHASCOGALE.

- Phascogale penicillata*, *Geoff. Schreb. Desm. Schinz.* *Dasyurus penicillatus*, *Geoff.* *Didelphis penicillata*, *Shaw.* *Petrogale penicillata*, *Gray.*
- Phascogale melas*, *Schinz.*
- Phascogale Swainsonii*, *Water. Schinz.*
- Phascogale flavipes*, *Waterh. Schinz.*

(To be continued.)

Miscellaneous Notices.

Change of Colour in the Bullfinch.—I have a Bullfinch which has turned a bright black from the natural colour.—SAMUEL BROWNE, the Vicarage, Dudley, December 8th., 1857.

I conclude that this is from its having been fed on hemp-seed: it is not an unusual change.—F. O. M.

The Avocet, (R. Avocetta.)—I have recently preserved a very fine specimen of this bird for Mr. Guteridge, of Faversham, Kent, shot close to the town. These birds were a few years since rather abundant in this neighbourhood.—JAMES GARDNER, 52, High Holborn, London.

Cuckoos Building a Nest.—At the latter end of April and the commencement of May we found a nest in the course of building, and not having seen such a nest before, we watched it, and had the satisfaction of seeing a pair of Cuckoos, (*Cuculus canorus*,) busily engaged constructing it. The birds were watched for many days by several persons, and unfortunately

attracted the attention of some boys, who threw stones at them, and eventually drove them away. The nest was built at the bottom of a hedge, in a small clover field, and was a bulky mass of hay and dried grasses; it was about nine inches in diameter, though the opening was only three inches. The birds had just commenced lining the nest with moss when driven away. The clover field was situated at the bottom of Woodhouse Ridge, near Battye Wood.—H. MARCH, JAMES J. BROADHEAD, No 1, Skinner Lane, Leeds, 9th. December, 1857.

Anecdote of a Sparrow.—A curious circumstance occurred to my wife some days since, as she was walking in the vicinity of this place. She observed a group of Common Sparrows, (sooty enough,) discussing that which to them was doubtless a treasure, though not so in our eyes. As she approached of course they took flight, but to her surprise, one of the number, after just rising from the road fell down again, and shuffling along as it were on his head, pitched two or three puddings, to use a common expression. She immediately picked it up, and carried it about in her hand for some time, considering that it was in a fit, and expecting that it would every moment give up the ghost, as it lay still, with half-closed eyes, panting sides, and its feet strangely contracted. However, suddenly a sort of struggle took place, and having ejected what appeared to be water, it waked up, became brighter, and speedily took flight, settling on an adjoining tree, and she saw it no more. I leave it to those who are more learned than I am in the diseases of birds, to say *hinc illæ lachrymæ!*—O. S. ROUND, Pembroke Square, Kensington, December 18th., 1857.

Partridges eaten by Hedgehogs.—Some years ago my brother had a brood of young Partridges eaten by some Hedgehogs we kept in the garden.—JOHN BROWN, Salisbury, January 7th., 1858.

European Bittern, (*Botaurus stellaris*.)—A fine specimen of this bird was shot by a gentleman yesterday, on a piece of marshy ground near Terregles House. Some time since one was shot near the same place, by Mr. Mc'Kenzie, Barnhill. The dismal booming of the Bittern in the dreary marsh at sunset, is now among the things that were, and this beautiful bird promises soon to be among our extinct species.—G., Dumfries, January 9th., 1858.

Mildness of the Season.—There are no want of paragraphs in the various papers just now, in proof of the mildness of the season. November and December have been quite spring months here. Summer flowers are still in bloom, and bees are occasionally seen amongst them. There is an apple-tree in a garden at Collin, with a fine second crop on it; and during the last week, the Bat has several times been seen sporting on our streets,

to the amusement of the boys, who gave it rather a rough reception. A pair of Canaries have built and are hatching in the house of Mr. Hastings, Thornhill. The Mavis is in full song; and the Crows, though not actually building, seem to be making every preparation for the coming spring.—Idem.

As another proof of the mildness of the present winter, I would mention the fact of my having gathered the flowers of the *Cornus sanguinea* in the hedges between Woolwich and Eltham, during the week succeeding that of Christmas.—W. R. TRAVIS, Blackheath, February 1st., 1858.

On the 30th. of December, I saw a Bat flying early in the evening, about the church at Sutton-on-Derwent. I had several times seen quite a flock of bees in this village, within a few days of that date.—F. O. MORRIS, Nunburnholme Rectory, January 11th., 1858.

Setting Lepidoptera.—With reference to Mr. Greene's instructions in the art of setting insects, and Mr. Bree's note thereon, I wish to say for the benefit of all entomological readers, that while I coincide with Mr. Greene as to the excellence of the pins No. 8 and No. 10, (though I would use the latter for more kinds than he recommends,) I do not agree with him at all as to No. 7, and also would substitute No. 13 only, for both his No. 11 and No. 12. Mr. Bree too does not say for what sorts it is that he recommends, in the note, Nos. 5 and 15 as the most useful sizes. Mr. Greene also omits to state, for the benefit of beginners, the depth the boards themselves should be of, but it may be inferred sufficiently nearly. The plan is not a new one, except as to the way of first moving the wings forward by means of a piece of wetted paper, which may perhaps be better than the more common and more easy mode of fixing them in their place, with a minute pin stuck through them, or may not. Mr. Greene does not mention the mode of setting on turned woods with cotton thread, but the effect is better, and the process more quickly performed.—F. O. MORRIS.

Felt instead of Cork for Insect Drawers and Boxes.—The other day I received a box of European lepidoptera from Professor Zeller, of Zurich, and the box was lined with felt instead of cork. The paper within it was perfectly smooth, as much so as in any cork-lined box. The pins, too, go into it with the greatest possible ease, but they do not seem to be, indeed they are not, held so tenaciously as by cork. Nevertheless, although the box came so far, not a single insect was loose in it; but I must mention on the other hand that they were placed on a thin stratum of cotton wool, spread over the paper,—an invaluable recipe, by-the-bye, I may add, in all cases of sending entomological boxes by the post. I should also say that the insects were, that is, many, not all of them, fastened in likewise with pins stuck crosswise over their bodies; but, as I have

just said, as this was not the case with all, their safety, notwithstanding the deficiency in the consistence of the felt, cannot be altogether attributable to this precaution. On the whole, it must be an excellent substitute for cork, particularly in "cases" where there is no moving about, and it must, I suppose, judging from the price charged, as we are informed at the railway stations, for "Groggon's Patent Asphalte Felt," namely, a penny a square foot, if I remember aright, be vastly cheaper than cork—some twentieth or fiftieth only of the price—and also laid down with much more ease and expedition, as being in a single piece. I shall be obliged to any of our readers who will give me the result of his experience on the subject, that I may "take the benefit of the act."—F. O. MORRIS, Nunburnholme Rectory, February 3rd., 1858.

Reviews.

The Poetical Works of Thomas Aird. One Volume. A New Edition.
WILLIAM BLACKWOOD AND SONS, Edinburgh and London.

HOWEVER much it may lower me in the opinion—I own I am surprised to say that I have no doubt it must be many of—my readers, I have to acknowledge, as I did in a review of a poem in a former number, that I am not in the general way fond of poetry, viz., the writings of so-called poets. With some exceptions, such as those mentioned before, "Percy's Reliques," Walter Scott, and Gray, to which I would add a few of the Oxford Prize Poems, Reginald Heber's "Palestine" for example, I think it is, for the most part, good prose, or bad as the case may be, the good spoiled, or the bad made worse.

Why should language in poetry, any more than in prose, be given only to conceal the thoughts? yet who can read (read, indeed! who can possibly have patience to read) Tennyson, to say nothing of some of the verses of Keble, or those of Longfellow, and have the least notion, without pondering them over like the most difficult chorus of the hardest of the Greek Plays, what on earth the writer means? This is not indeed much to be wondered at, inasmuch as we must often shrewdly guess that the writer did not know himself, his mind as well as his eye having been manifestly all the while "in a fine frenzy rolling."

There is a story told somewhere of a lawyer who used to write a shocking bad hand, or rather three bad ones, one which only his clerk could read after he had written it, another which only he himself could read afterwards, and a third which neither he nor his clerk could make head or tail of. In the predicament of this last category it is to me perfectly clear that most of our modern poets are. Yet surely if Euclid

begins with his axioms, postulates, and definitions, the very first rule we ought to have for good writing—and poetry, I suppose, is to be considered as the handiwork of those for whom prose is not good enough—ought to be that it should be capable of being understood, and understood easily and at once, where at least the subject is not difficult.

How refreshing then to meet here and there with a poet whose poetry has the rare merit of being understandable!—Here we have one of this class. The writer, too, is evidently one who “loves the country for the country’s sake,” and thoroughly understands the healthy enjoyment of it, and what is more to my present purpose, expresses himself, I say, in such a way as that his readers may enter into his feelings and go with him up the mountain side, or by the cool brook, along the green meadow or the shady lane, and pay with him a morning visit to a country neighbour, at the old hall, grey parsonage, gabled farm-house, or quaint cottage. This I speak, or write rather, of one of his poems, “Frank Sylvan,” for there are several others in the volume to suit a variety of tastes, as follows:—“The Holy Cottage,” “Genius,” “The Champion,” “An Evening Walk,” “The Devil’s Dream on Mount Aksbeck,” “The River,” “The Christian Bride,” “Byron,” “Belshazzar’s Feast,” “The Swallow,” “Monkwood,” “Night,” “Tales of the Siege of Jerusalem,” “Fanny,” “A Summer Day,” “The Captive of Fez,” “A Winter Day,” “Wash the feet of poor old Age,” “The Tragic Poem of Wold,” “My Mother’s Grave,” “Flowers of the old Scottish Thistle,” “The Prophecy,” “The Translation of Beauty,” “Recovery from Sickness,” “Nebuchadnezzar,” “A Father’s Curse,” “A Mother’s Blessing,” “The Churchyard,” “The Old Soldier,” “To a Young Poet,” and “The Demoniac.”

Some of these poems are just what one likes, and undeniably good poetry, and, what is still better, a manly, natural tone pervades them, and a spirit of morality, reverence, and piety. It will not however do for me after what I have said, to set myself up as a critic of poetry, but so far as I have to do so, I must fulfil that most essential part of a critic’s character, and go out of my way to find fault—no very difficult matter, good reader, with any book of human composition that ever was written. I will however be very brief; in fact there is very little fault, except as thus searched out, to find. The author seems to me too fond of the use of the word “aye,” (for “ever,”) a fault I have often seen before in the poems of others, for it cannot be right to make common use of a disused word solely for the sake of the filling up measurement. Thus on pages 9, 13, 14, 18, and 68.

There are also some words used which are unknown to me, and I should suppose to others, but that may be the fault of my ignorance and theirs, such as “pleached,” “spilth,” “swirls,” “lipping,” etc. These, however, are

minor faults, if faults they be at all. The poems, I repeat, themselves are good, very good, and the volume, a small one of 439 pages, is a capital present to make to a friend, especially in these days when "capital" of another kind bears far too much sway, and it is not every one who has the healthy tone of Mr. Aird, and fewer still, who, if they have it, can commit it to good poetry.

The last line of the volume—

"And set in the bosom of her God,"

reminds me of those of Gray—

"There they alike in trembling hope repose,
The bosom of his father and his God;"

but even if borrowed, intentionally or unintentionally, this is either a trifling fault or no fault at all, and if the one or the other, it is one committed in very good company. Thus it has been shewn, (by Dr. Doran,) that, as Bulwer has observed, "Books are magnets to which all iron minds insensibly move," and as examples of this he gives quotations to prove it. —Spenser has borrowed from Tasso and Ariosto; Merivale from Dante; Lord Bacon from Giordano Bruno; Goldsmith from Young; Pope from Milton, Shakespeare, Charron, and Flatman; Shelley from Sir Thomas Browne; Gray from Milton, Bishop Hall, and Lucretius; Byron from Burton, Dante, Waller, and Goethe; Tennyson from Anacreon; Sir Robert Cotton from the Public Record; Hackett from Camden; Rogers from Gray; Campbell from Blair and Vaughan; Parnell from Martin Luther; Sterne from Burton, Rabelais, Montaigne, Bayle, and Leightenhouse; Thomson from Homer; Moore from Waller; Shakespeare from Barnfield and Beaumont and Fletcher; Milton from Grotius, Petrarch, Dante, Ariosto, and Ramsay; Madame de Genlis from Rousseau and Voltaire; Adam Clarke from Dr. Gill; Matthew Henry from Bishop Hall; Scott from Matthew Henry; Captain Marryatt from Kendall and Gregg; Franklin from Logan and Jeremy Taylor.

"Every one of my writings," says Goethe, in the true spirit of candour, "has been furnished to me by a thousand different persons in a thousand different things; the learned and the ignorant, the wise and the foolish, infancy and age, have come in turn, generally without having the least suspicion of it, to bring me the offering of their thoughts, their faculties, their experience; often have they sown the harvest I have reaped. My work is that of an aggregation of human beings; taken from the whole of nature, it bears the name of Goethe."

"When I was a young man," says Goldsmith, "being anxious to distinguish myself, I was perpetually starting new propositions; but I soon gave this over, for I found that generally what was new was false."

"As for originality," said Byron, "all pretensions to it are ridiculous;" and Moore once observing him with a book full of marks, asked him what it was. "Only a book," he answered, "from which I am trying to *crib*, as I do whenever I can, and that's the way I get the character of an original poet."

Emerson says that an author is original in proportion to the amount he steals from Plato; and Seneca complains that the ancients had compelled him to borrow from them what they would have taken from him if he had been lucky enough to have preceded them.

There is a passage in the poem entitled "A Summer Day" I should like to quote, ("unum e multis") of the "right sort," on pages 128-9, beginning with "The Queen;" but I have no more space, and refer my readers for their satisfaction to the volume itself.

P. S.—I must draw attention to the short one entitled the "Swallow," not only for its intrinsic merit, but on account of the coincidence, undesigned, between it and my account of the Martin in my "History of British Birds."

Manual of the Land and Fresh-water Shells of the British Islands; with Figures of each of the kinds, by William Turton, M.D. New Edition, with Additions. By John Edward Gray, Ph.D., F.R.S., F.L.S., F.R.G.S., V.P.Z.S., and Ent. Soc., etc. London: LONGMAN, BROWN, GREEN, LONGMANS, AND ROBERTS. 1857.

THIS edition of the work before us comes down to the recent date just mentioned, and, in fact, almost deserves the name of a new work. It is of a convenient size for carrying about in the pocket. It contains a description of every British species, with a coloured figure of each, and indeed more than one of several. It is a work which no conchologist or collector of British Shells can do without.

The Geologist. Vol. I., No. I., January 1st., 1858. A popular monthly Magazine of Geology. Price One Shilling. London: SIMPKIN AND MARSHALL. Kenilworth: WALTER T. PARSONS.

THIS is a new Magazine on the interest of Geology, and one which seems likely to do good service to that study. It includes—1st., a leading article, by the Editor; 2nd., Geology considered with reference to its utility and Practical Effects, by the Rev. P. B. Brodie, M.A., etc.; 3rd., Abstract of a Notice of a New Genus of Crinoides; 4th., On Bone-beds and their Characteristic Fossils, by the Rev. W. S. Symonds, F.G.S.; 5th., The Common Fossils of the British Rocks, by S. J. Mackie, Esq., F.G.S., etc.; 6th., Foreign Correspondence, by Dr. T. L. Phipson, of Paris; 7th., Review, Memorial of Andrew Crosse. I remember a friend of mine

a banker, in London, who knows the place well, telling me that it is a fact that shilling and sixpenny exhibitions succeed, while higher-priced ones tell. The same, I think, holds good with books, I mean, at least, with periodical publications; in fact I have proved the truth of it in my own works. I venture to think that the Magazine before us will be another exemplification of the rule. There are two very well-executed plates in the present number.

Proceedings of Societies.

Thirsk Natural History Society.—Botanical Exchange Club.—The monthly meeting of the Thirsk Natural History Society was held on the evening of Friday, the 8th. of January. Mr. J. G. Baker reported the proceedings of the Botanical Exchange Club. The following botanists were duly enrolled as members, namely, Miss Atwood, 3, Victoria Place, Bath; J. A. Brewer, F.L.S., Holmesdale House, Reigate; W. Brewer, Reigate; T. B. Flower, F.L.S., Beaufort Buildings, Bath; A. Henfrey, F.L.S., Heathfield Terrace, Turnham Green, London; J. Linnell, Jun., Redstone, Reigate; Thomas Lyle, M.D., 314, High Street, Glasgow; J. D. Salmon, F.L.S., 174, Strand, London; W. Soper, Reigate; J. T. Syme, F.L.S., Gordon Street, Gordon Square, London. He laid before the meeting notices of the occurrence of *Nuphar pumila* in Shropshire, of *Aremonia agrimonioides*, in a naturalized condition, in Fifeshire, and a review of the first part of Bourgingnat's 'Flora of the department of the Aube.

Mr. Davies described *Orthobrichum obtusifolium*, a moss new to Britain; and reported it from the neighbourhood of York, and two localities in Gloucestershire; and exhibited specimens of *Hypnum hians*, a moss new to Europe, recently discovered by Mr. Mitten, in Sussex; and of *H. speciosum* from the neighbourhood of Thirsk.

The Querist.

Drying of Plants.—Would any practical botanist please inform a novice the way in which they manage to dry and carry about with them, the plants collected during a pedestrian tour—in Wales for instance?—W. M. F., Liverpool, January 7th., 1858.

Food for the English Snake.—Would you kindly inform me how to induce the English Snake to drink milk, and also if there is any other animal food besides frogs, that they are partial to. I have several Snakes, and fear when they recover from their state of torpor, they will die unless I am able to find some other food than frogs for them, as I cannot obtain a supply.—JOHN BROWN, Salisbury, January 7th., 1858.



GEORGE KING,

In returning thanks to his numerous supporters, wishes to inform them that he has several thousands of Insects for sale at reduced prices; as he is emptying his Store Boxes for his approaching Summer Tour through Scotland and Shetland, returning to Horning Fen in July, and thence into Devonshire and Cornwall; during which he will collect Insects, Eggs, Shells, Marine Animals, Ferns, etc.

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BY C. R. BREE, ESQ.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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Communications have been received by the Rev. F. O. MORRIS, from Messrs. W. SUTHERLAND;—R. B. COOKE;—O. S. ROUND, (two);—W. V. GUISE;—J. G. BAKER;—C. T. MAURICE;—C. FAULKNER;—H. BURKLEY;—C. ELLIS;—T. THORNCROFT;—A. H;—REV. J. DALTON.

Communications, Drawings, Advertisements, Books for Review and Parcels, to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York.

ENTOMOLOGY.

Communications have been received by C. R. Bree from The Rev. J. GREENE, (two);—REV. H. CREWE, (two);—CAPTAIN COX;—MR. MATHEWS;—MR. UNWIN. Several communications stand over.

* * All communications on Entomology intended for insertion in this department of "The Naturalist," must be sent before the 15th. of the month to C. R. BREE, Esq., *Stowmarket, Suffolk*.

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THE ART OF LIVING IN HARMONY.

BY O. S. ROUND, ESQ.



As we walk over Waterloo Bridge, or perhaps traverse Trafalgar Square, we see a square wire cage, with a little crowd, chiefly of boys and women before it, whilst a kind of keeper, in a brown velveteen jacket with a small stick, stands at the side in attendance, and upon a small piece of board is written, in legible characters, "The United Happy Family;" and certainly they are united in a very small space, and appear to be happy. Most of my readers know, and have seen this curious assemblage of animals, usually considered to be most antagonistic in nature to each other, and we naturally wonder how it is that cats and mice, hawks and sparrows, in short, predaceous animals and their prey should be inclosed in the same den, and not fulfil their nature by devouring each other. So, however, it is, and without inquiring into the precise mode employed to bring about so unexpected a consequence, we answer, briefly, that it is the effect of *education*. It has been made a question how the word "natural" should be understood, some insisting that it is that state in which we and all animals are born—without education; whilst others argue that it is that condition which the animal nature is capable of. Without taking either side of this dispute, it may be safely asserted that whatever capabilities have been implanted in us by the Almighty, were intended to be used, and not only so, but improved to the utmost extent to which those capabilities can be carried.

It has been found by experience that the faculties of both reasonable and unreasonable creatures can receive, retain, and turn to account certain things communicated to them either by speech or exhibition, and imitate, or even surpass, the acquirements of their teachers; and not only are these the *media* of imparting knowledge, but the very sensations, instincts, and propensities, which are implanted in them, are also enlisted in this service, and made likewise engines, the one subverting the other. In the instance which I put by way of illustration at the commencement of this paper, this subversion is fully exemplified; for although it may be said, and probably with great truth, that dogs do not worry cats by nature, yet it cannot be denied that small birds are the natural prey of hawks and owls, and rats and mice of cats, as much as rabbits and hares are the objects of pursuit of dogs, and yet in the instance referred to, all these are found in one cage.

Boys (those troublesome members of the community) generally take good care that dogs shall not want the propensity to worry the feline race, and most disgusting and cruel instances have I seen of this; but thanks to Christian legislation, there have been found those who have protected poor

pussy from her many enemies; still almost every one knows instances where a Blenheim, or a King Charles, or even perhaps a terrier, and a tabby have existed in the same house with perfect good nature and hurtlessness, (to coin a word.) I myself know a notable instance of a very savage terrier, "a fell rat-catcher," whom I have seen very much "enforced" by a cat, who would keep seizing a very short tail, which was describing a rapid curve on the surface of the rug, and yet nothing more than a vexed growl was elicited, although I own I quaked for the wolfish nature which might have been roused, but fortunately for all parties was not.

What I would aim at from all this is, that, borrowing an illustration from the "United Happy Family," it is possible not only for us so to tutor the most savage animal natures to live together in perfect harmony, but to do so ourselves. It is a great part of the contemplation of nature that it should conduce not only to our own enjoyment, but that we should endeavour by every means in our power to foster, to conduce to, and to promote that delightful order and beauty in animate, which we universally find in inanimate objects. Of course we cannot deny that throughout all nature there is the canker of evil passions, of rage, of ferocity, of antagonism, but I have shewn that it is possible to overcome this, and therefore why should it not be the aim of every one, as much as in him or her lies, to lend his or her aid to overcome it, and more than all to begin at home. We feel the curse in our own hearts, whenever there is the least occasion that calls it forth; let us therefore strike at the root of the evil, and be assured that our endeavours will be laying out capital at a very high rate of interest. It will return to us, perhaps, "after many days," but in the most unexpected and welcome manner. Kindness begets kindness, mercy begets mercy, and never let us forget that as we have the power to exercise universal goodwill, so shall we extend it to a degree which at the time we know not of. Whenever we can help, in the most trifling way, let the help be cheerfully, and above all, spontaneously given, for the motive makes the value; check the irritable risings of your temper whenever they are produced by any cause, and remember that he who conquers himself is greater than he who "taketh a city." God help me, poor erring mortal that I am, I feel how I need all this to be pressed upon myself, but I do not therefore fail to impress it upon others, for I thereby press it on myself. I have through His help been enabled, to a small degree, to practice what I preach, and I know of nothing that has so helped me as the calm contemplation of natural objects.

Go from the struggle of men into the fields on a mild day, and the true harmony there reigning will come upon you with a double zest; you will envy, in a mere wishing sense, the lark as he soars on high, not wish to bring him down with a shot; you will admire the hare as he picks his

morning meal among the bents, and not wish to turn all his innocent enjoyment to a bloody death; you will watch the insect tribes, with their painted or their gilded wings, and think how beautiful they are, and not wish them in your cabinet; in fine, you will see there may be peace in the earth of your own making. In a late paper, and in other previous ones, I have discussed the question of justifiable destruction of life; I still adhere to those opinions, and would never in my own person take life for mere wantonness, or where it could possibly be avoided. I am sure if we cultivated this spirit we should make others happier, and be happier ourselves.

Pembroke Square, Kensington, December 10th., 1857.

ON UNITY OF SYSTEM.

(Continued from Vol. vii., page 267.)

It is obvious that time and space, as manifested or expressed by the visible creation, form no part of eternity and of infinity, but may rather be termed a divergence from them; and it will also appear that the single divergence, which comprises all the natural creation, is composed of a succession of divergences, and that this law of divergence is manifest in every living being, and that the whole system appears in every part, and that every part more or less expresses the whole; also that this law extends from the beginning to the end of creation, so far as it is made known to man, and that by it all creatures are brought to one level or equality, and that this impartiality would not appear if the law of development and of progress were supreme. On various accounts it is not the purpose of the present notes to illustrate this law fully and methodically, but to call attention to the subject, and to shew the identity of the system in the Bible and in human history with that of Nature, and that the knowledge of them all is progressive, and that their mutual agreement appears to increase in proportion as the knowledge of them is equally progressive.

The fact of the Deity being eternal and infinite, and everywhere the same, and all creation being of Him, shews that an erroneous idea may be conveyed by the common expression that He made the worlds of nothing. How this Power (who fills all space) and the earthly or visible creation (which is in Him, and in which He is hidden) are consistent, is by the Bible explained partly, or as much as man can comprehend. The belief in a future and better state is generally acknowledged, but it is a fallacy (as will afterwards appear) to suppose that man, of himself, can make any progress towards that state; all his superiority, when compared with other creatures, and when compared with his fellow-creatures is final, has one

common origin, and will cease with his present existence; and not only so, but this superiority in its progress becomes more remote from a higher state. If the present creation had been ordained to originate from nothing, and to be susceptible of progress, no answer could be given to the inquiry,—Why is its perfection so limited, and why do not its various beauties co-exist, instead of the development of one of them always requiring the cessation of some other one? But it is certain that the works of the Creator, unlike the works of man, have not an existence separate from Him, but that the present or visible creation, and every part of it, is merely the middle state,—beginning in and ending in an eternal manifestation of power.

The term middle part is conventional, rather than fully expressive of the creation, for, as will appear, like as the measurements of space and the epochs of time do not add to or diminish from eternity and infinity, so the present creation does not really (as the middle part in visible objects which connects the beginning with the end) divide or come between the eternal life which precedes and succeeds it, and by which alone it exists, but may rather be termed a divergence from it; and one of the objects in these notes is to shew that the law of divergence governs all nature, and may in like manner be traced in each of its parts, and in every creature. According to this law the present world, whether collectively or individually, makes no real progress in its developments; they are all divergences, have one common origin, and their various perfections pass away by the law of degradation. Its inability to raise itself declares it to be partial, or incomplete and deficient; all its strength consists in or is derived from its beginning, which is also its end, that is, the eternal life. This Power is said to be suppressed from the foundation of the world; and though every individual plant, and animal, and higher creature derives its being and continuance from this Power, as much as a stream depends on its source, yet the life of every creature throughout the earth diverges from, and is more or less opposed to, its source, or to the same power in its eternal state, which is thus said to be suppressed. And this suppression is necessary for the natural creation, which could not otherwise exist in its various adaptations and counteractions—a time will come when the suppression will cease, and then the present creation will be changed, or be wholly renewed.

As thus the existences of all creatures do not begin from nothing, but from an eternal Power, all the divergences have their origin in Him, and He, as it were, bears them, or is answerable for them, and they will all return to or be renewed in Him, excepting the cases of responsibility, where the divergence is persevered in, though a conviction of its end may be acquired, and the being is then cut off in the divergence, or divided from the eternal source, to which the gratifications of even this life are all

owing. The return in man of his spirit or life to its source from the divergence, whereby it is set free, and is assured of possessing all things, is called a new life in him; and the beginning of this new life in man is as much out of his own power as is his natural life. This eternal life has no development in the present state of the earth, the latter being wholly adapted to its successive divergences. The nature of man leads him to suppose that in progressive nations mankind can become gradually more fitted for a higher state of existence; and if it were so, Christ, or the eternal life, would be only the end of the eternal life, and not also the beginning, and this life would continually increase in perfection; but, as it will appear, it is not so—all cases of its progress are merely divergences, and by the unity of system cannot be otherwise than so, though in each development there is an analogy to a higher state, as will afterwards be noticed.

As the spirit of life and all power proceeds from the Deity, and is in unity with its source, or pure and perfect, and as the natural life also originates in the Spirit and by Christ, it is evident that they are identical, the natural spirit being a divergence of the eternal spirit, and more or less opposed to it, and thus having its limits in all its manifestations, or in all the creatures of this world. Accordingly, it is found that the one spirit is frequently mentioned in conjunction with the other, and that the increase of one is attended with an equal decrease of the other, the one being transferred or converted to the other, or suppressed in proportion to the growth of the other. This process is as various as are the agents in whom it occurs, and may be sudden or slow, early in life or late in life, permanent or transitory, the predisposition or feeling of the want for the change being always required of the persons before they receive it. As before mentioned, this present life in every creature requires a suppression of the eternal life, being in divergence or opposition to the source whence it proceeds, and a renewal is ordained to follow this suppression, but a second renewal is not allowed in case of a second suppression.

(To be continued.)

MOSSES IN THE NEIGHBOURHOOD OF STOKESLEY, YORKSHIRE.

BY J. D.

THE under-mentioned Mosses were found in the course of a very few walks, taken for the most part with another object than that of collecting them. Perhaps an experienced Botanist—a title to which I have no claim

—may be able to judge from them of other and rarer species, which he is likely to meet with in the same localities.

I can answer for the correctness of the nomenclature, as Mr. Wilson has most kindly verified those species about which I was in any degree uncertain.

Sphagnum squarrosum.—In fruit on Kirkby Bank, but not very abundantly.

S. cuspidatum.—Pools of water on Cran Moor: abundant, but always barren.

Dieranum squarrosum.—In fruit on Kirkby Bank, by the side of rivulets: common; barren plants growing to a great length.

Leucobryum glaucum.—On the moor in Bilsdale, but always barren.

Distichium capillaceum.—Growing sparingly on Kirkby Bank, but in great perfection.

Didymodon flexifolius.—Bilsdale Moor: common.

Trichostomum flexicaule.—Growing sparingly amongst rocks on the extreme summit of Cold Moor, but without fructification.

Eucalypta vulgaris.—With the above on the highest summit of Cold Moor.

Racomitrium canescens.—Kirkby Bank: abundant near Carlton, in Cleveland, etc.

Orthotrichum pumilum.—Wood near Ingleby Greenhow.

O. Lyellii.—Wood on the left-hand side of the road leading from Great Broughton to Bilsdale, but always barren.

O. pulchellum.—Woods at Ingleby Greenhow, but sparingly distributed.

Tetradontium Brownianum.—On Sandstone Rocks on Kirkby Bank; also at the Wainstone Rocks, but not very common.

Aulacomnium androgynum.—Abundant at the Wainstone, but (of course) barren.

Bryum crudum.—Rocks on the summit of Cold Moor: bearing fruit in May.

B. Wahlenbergii.—Abundant by the side of a rivulet running down Kirkby Bank: fruit in April.

Mnium subglobosum.—Wet places on Kirkby Bank, in abundant fructification and very fine: April, 1857.

Bartramia fontana.—Wet places on the Moor; very abundant and handsome.

B. pomiformis.—By the side of the road leading from Kirkby to Bilsdale Wood, near the Wainstone Rocks.

B. arcuata.—By the side of a rivulet running down Kirkby Bank, near the Wall that divides it from Carlton Moor. I only found it in this one place, and there was no fructification, though the moss was luxuriant and handsome.

Discelium nudum.—On clay at the foot of Kirkby Bank, on the left-hand side of the Bilsdale bridle road: very scarce.

Schistostega osmundacea.—In a dark cavern at the Wainstone Rocks, growing very sparingly with *Tetraphis ovata*. Only a single patch of it, but bearing fruit in high perfection last April.

Fissidens adiantoides.—Kirkby Bank; also the variety with short setæ, mentioned by Wilson.

F. bryoides.—Very common.

Hypnum rivulare.—Stream on Kirkby Moor, but without fruit.

H. crassinervium.—Wall near the Church of Ingleby Greenhow: barren.

H. stramineum.—Abundant in wet places on Kirkby and Carlton Moors, but always barren.

H. Schreberi.—Common everywhere, but very rarely with fructification. In fruit near the Wainstone, December, 1856.

H. splendens.—Abundant in fruit by the road-side between Ingleby Greenhow and Battersby.

H. loreum.—Very common, but rare in fruit: Carlton Moor, Oct., 1856.

H. squarrosum.—Abundantly fructifying on Kirkby Bank.

H. fluitans.—In fruit in the bogs on Cran Moor.

H. commutatum.—In fruit by the side of rivulets on Kirkby and Carlton Moors.

Hookeria lucens.—In shady woods in Bilsdale: common.

NATURAL HISTORY OF NUNBURNHOLME.

BY THE REV. F. O. MORRIS.

(Continued from page 57.)

I CANNOT, however, reach the flock that cuts the air overhead in marshalled rank, under the leadership of the chieftain gander, and so am unable to speak more positively than I have done by conjecture, as to the name of the bird that I see and hear aloft. The ordinary gun, or fowling-piece, would carry but a small distance towards the "Old High-flyer." (Gone has the "London and York" stage-coach of that name from the "Great North Road" this many a day, nor ever again will its team turn in at the portals of the "Black Swan," as was its wont in the "good old times," which in like manner are fled for ever, and will never come again.) Even the rifle, whether "Enfield" or "Minie," would have but a small chance of sending its bullet "up so high," and still less would the cloth-yard arrow of the best yew bow that was ever strung by the hands of "Robin Hood or Little John," hight "Adam Bell, Clym of the Clough, or William of Cloudeslie," those archers good and true,

strike the breast of the cackling wild-geese as he is "going home" towards night. He has no fear as he steadily wings his way to the Humber or the Trent, of sharing the fate of the ill-starred eagle,

"Which on the shaft that made him die
Espied a feather of his own,
Wherewith he'd wont to soar so high;"

nor dreads that the "grey goose wing" that steers the shaft will in his kindred "heart's blood be wet." But I must come down from this "wild-geese chase!" So much for "Number One" of the Fauna that compose the Natural History of Nunburnholme.

Number two. On the same principle that I claimed the Pink-footed Goose as a species for my Natural History of this Garden—"the Garden of England"—I might also claim the Kestrel, but I do so on a nearer view. A specimen alighted one day on the birch tree in front of the house. We have indeed a row of ivy-covered birch trees on one side of the Rectory, but this birch tree I must tell you is a very beautiful tree, and of the sort called the weeping birch—the female tree, I believe. Nothing can be more exquisite than to see its hanging sprays filled with leaves in the summer, and quivering with the gentle breeze of that time of the year; and again in winter,

"When the hoar-frost is chill
Upon mountain and rill,"

it is a lovely sight to see it sparkling in the sun with myriads of pearls and diamonds; every little branch, every smallest twig frosted over with silver, and exhibiting the new foliage of a night, which in its turn will "fade and fall away" into its component drops, and be distilled into the pure air from which it has descended.

But I have left my Kestrel standing in the cold; not that he minds it much—he will soon be gone: look at him while yet you may. There is not a handsomer bird than the Kestrel, the male I mean, for the hen bird is altogether of a different appearance, barred and mottled like a yearling. But the male, what a beautiful back he has! where can you see such a bright cinnamon colour? and how elegantly is it picked out with black crescents! He is off: how well and easily he flies. Now he hovers: away he sweeps—he is out of sight!

Number three. Within three or four yards of our drawing-room windows looking south,

(To be continued.)

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 60.)

48. *P. lacertula*.—Rare. A few specimens by beating.

N.B.—This moth is double-brooded, appearing in May and June, and again in August. The larva may be beaten from birch in July, and again in September and October. I have taken it both in the woods near Ipswich and in this neighbourhood. When full-fed it unites the edges of a leaf by a very strong web, and turns to a pale red pupa covered with a white bloom, like that of *C. diffinis*. (C.)

49. *P. fulcula*.—Common. The larva feeds on birch and alder, and the insect is double-brooded.

N.B.—The larva of this insect is pale green, with a broad reddish dorsal stripe, and is studded with small tubercles, or rather spiculæ. Like that of *Lacertula* it spins the edges of a leaf together with a strong web, and turns to a dark chesnut brown pupa, somewhat similar to that of *C. duplaris*. (C.)

50. *P. hamula*.—One beaten from oak.

N.B.—Taken at Ringshall and Battisford, by Mr. W. Baker. It is double-brooded, appearing at the same time as *P. lacertula*. (C.)

51. *P. unguicula*.—Taken by Mr. W. Baker, at Ringshall and Battisford. (C.)

52 and 53. *C. furcula* and *bifida*.—Not very common, that is, not very commonly found, though empty cocoons were in profusion.

N.B.—Mr. W. D. Crotch, in his amusing paper at page 52, No. 59, of the "Intelligencer," says that he found the cocoons of both these insects on *poplar*. Now I have been in the habit of taking both egg and larva of both species for some years past, and have found *furcula* upon every species of *willow* and *sallow*, and vice versa, *bifida* upon *poplar*, but I never found the former upon any species of *poplar*, or the latter upon *willow* and *sallow*, and I no more believe that they ever desert their respective trees, than I do that the larva of *N. dictæa* ever feeds upon *birch*, or *N. dictæoides* upon *poplar*. I have not unfrequently found the cocoons of *C. vinula* upon the trunk of an *oak*, but I never for a moment supposed that the larva had fed upon that tree, and have always found either a *poplar*, *sallow*, or *willow* close at hand. If there were any *sallows* or *willows* near Mr. Crotch's *poplar*, I can easily account for his finding the cocoons of both species on the same tree, but otherwise I am at a loss to do so. It is worth while looking for

the little black eggs of *C. furcula* and *bifida* at the end of May and in June. They are generally laid on the leaf, and almost invariably upon the upper side. Sometimes, however, they are deposited upon the twigs. The young larvæ are not difficult to rear after they have moulted once or twice. (C.)

54. *C. vinula*.—Common. I do not remember whether I mentioned in my paper on pupa digging, that the empty cocoons of this species are occasionally used by caterpillars too lazy to make one of their own; such is the case, however, and they should consequently be always carefully broken open.

55. *P. cassinea*.—Larva not uncommon, but very difficult to rear. Even supposing you obtain a pupa from your larva, which happens about once in twenty times, it is very apt to dry up, or to produce a cripple. Though I must have had one hundred larvæ of this species since I first began to collect, I am still without a female. I took about eighteen this spring and summer, and they resulted in *one* pupa. Tenderly and anxiously was this "one chick" watched over, and at length it came out on the 1st. of December, very late by the way, and produced the long-desired female; but, alas! it was a cripple! May others have better success.

N.B.—I found this larva in the spring of 1857, on oak, hazel, saw, and ash. It prefers, I think, the two former trees. From nine larvæ so obtained, I was fortunate enough to breed six specimens of the perfect insect in the autumn, three ♂ and three ♀. Two of them, one ♂ and one ♀ were crippled, which I attributed to my having moved those particular pupæ, a very bad plan. Their dates of appearance were, first, November 6th., ♀; last, December 3rd., ♀. (B.)

The larva is polyphagous; I have either beaten it or seen it beaten from oak, ash, elm, lime, saw, beech, aspen, and hazel. From the latter tree I beat seven or eight very small larvæ this spring, about the 7th. of May. In this stage of its existence the larva is a voracious cannibal; out of my seven or eight larvæ, only three were left in a very few days. About the same time, Mr. Bernard Smith was rearing a brood from the egg, and he informed me that more than half fell victims to the cannibal propensities of their comrades. This unnatural appetite seems to cease when they are about half fed. In confinement this larva requires plenty of air. If it is kept in a box with a close-fitting lid, it perspires freely and soon dies; I lost at least twenty in this way this year, and write to warn others. The egg, which is laid in the autumn, is a dull slate-colour, and is a very peculiar one. The lower part is saucer-shaped, the upper raised like the lid of a jar; between the two parts runs a sort of rim. The upper half is beautifully ribbed, the points of the ribs all meeting at the apex in a kind of knob. The lower half is also ribbed, but less distinctly. The whole very much reminds the observer of a round cut-glass butter-boat. I am indebted to the liberality of Mr. Bingham, of Newnham, for the eggs from which this description is taken. (C.)

56. *P. palpina*.—By no means common.

N.B.—I have never had any doubt in my own mind for some years past that this insect is double-brooded, as I have several times taken the larva full-fed in July, and again commonly in September and October. It feeds indis-

criminally upon the various species of willow, sallow, and poplar, which grow in this country. M. Duponchel gives lime as one of its food-plants, but I never saw or heard of its being found upon that tree. Accident has hitherto prevented my rearing the larvæ which I have found in July, so that I am unable to prove its double-broodedness from my own personal experience, but upon taking up "L'histoire Naturelle des Chenilles," by M. Duponchel and Guenée, a few days since, I found my suspicion most satisfactorily confirmed in the following words:—"This larva feeds upon willow, poplar, and sometimes also lime. There are two broods. The first brood appears in June, and produces the perfect insect at the end of a month or six weeks. The second appears in October, and does not complete its transformation till the end of April or the beginning of May in the following year."—"Cette chenille vit sur le saule, le peuplier et quelque fois aussi sur le tilleul. Elle a deux générations. Les individus de la première se trouvent en Juin, et donnent leurs papillons au bout d'un mois ou six semaines. Ceux de la seconde paraissent en Octobre, et ne deviennent insectes parfaits qu'à la fin d'Avril, ou au commencement de Mai de l'année suivante." The egg, which is white and opaque, and more raised than those of the *Notodontæ*, is laid on the under side of the leaf. I have not unfrequently reared the young larvæ from eggs thus found. I am happy to find that my indefatigable correspondent, Mr. Gascoyne, of Newark, who has so satisfactorily supplied the "only link wanting in my chain of evidence" in support of the double-broodedness of *N. dictæa* and *N. ziczac*, has got a goodly stock of the pupæ of *P. palpina*, and fully intends to corroborate M. Guenée's remarks next season. (C.)

57. *N. dictæa*.—With this insect we enter upon a wide field of discussion, the double or not double-broodedness of some of the *Notodontidæ*. My own opinion is, that in a state of nature they are *not* so. That I have never succeeded in rearing two broods in the same year, I readily admit, proves nothing, because others may, nay, *have* done so. But still I am disposed to think this an abnormal circumstance. I ground my opinion on this fact. For years I have been in the habit of digging up the pupæ of *Dictæa* and *Camelina*. During that period I must have had at least two hundred of the former, and five hundred of the latter. Now the supporters of the double-brooded theory maintain that eggs are hatched in June, or thereabouts, and that the larvæ feed up and produce perfect insects in August and September. If this be correct, is it not singular that not *one* of the pupæ dug up in August and September, should ever appear in the perfect state till the beginning of the following summer? And yet this has been unquestionably the case with me; I have even tried to *force* pupæ obtained in August, but in vain. They have indeed appeared somewhat earlier in the *ensuing* year, but *never* the *same* year. A gentleman, signing himself F. K., "Intelligencer," vol. ii., page 172, says he found a full-grown larva of *Dictæa* some time in July, which immediately spun up, and produced a perfect insect in about three or four weeks. Was the pupa left in the open air, as in a state of nature? If not it in no way affects my argument. Again, at page 173, Mr. Naish states that "last *spring* I had two female *Dictæa*, which laid a fine lot of eggs; these appeared in the imago state the beginning of this month," that is, August. Now last

spring is a vague term, and therefore I do not know the precise date when Mr. Naish found or bred these two females. For my own part, I have never found or bred, except when forced, *Dictæa* earlier than the first week in June. Now *assuming* that this was the period in Mr. Naish's case, we have just eight weeks for the eggs to hatch, the larva to feed up, and for the insect to remain in the pupa. Without at all questioning the accuracy of this statement, I must be permitted to say that this most unusual and rapid development was, in my opinion, due to their having been bred in confinement. It is evident in this and similar cases, that the larva must have become a pupa, at the *latest*, by the middle of July. Has any "pupa digger" ever turned up *Dictæa* in July? I can confidently assert that I never have; I never found it earlier than the second week in August—rarely before the *end* of that month. If the experience of others coincide with mine in this respect, this fact strongly militates against the notion, that in its *natural* state it is double-brooded. But even supposing that some fortunate digger *has* turned up a *Camelina* or a *Dictæa* in July; did it emerge the same year? I feel confident that it did *not*. The argument so strongly relied upon by some, that fine and perfect specimens are found during many months of the same year, *proves* literally nothing. I have bred specimens of *Camelina* out of the same batch of pupæ, from the middle of May to the end of August. Again, it is well known that the larvæ, which in a state of nature hybernate, of some species will, when in confinement, occasionally feed up rapidly, at least *some* of them, and produce the perfect insect in the same year; for instance, *A. caja*. Yet no one asserts that *Caja* is therefore double-brooded naturally. From my own observations therefore, I am disposed to say, without, I trust, dogmatizing, that neither *Camelina* or *Dictæa* is *naturally* double-brooded. The discussion now opened will, I hope, be fully carried out in the pages of "The Naturalist," and at the same time in a friendly and gentleman-like spirit.

N. B.—In the neighbourhood of Stowmarket this insect is very uncommon. I have seen but one larva during the past season, and during a long residence here, my friend Mr. Bree, has not met with either larva, pupa, or perfect insect. The egg, which is a delicate white, is laid on the back of the leaf, and may be found from June to August. Like the rest of the *Notodonta* *N. dictæa* generally lays her eggs singly, but I once found twenty-six on one twig. The larva, though generally greenish white with a yellow stripe on the side, is not unfrequently of a dull olive brown, clouded on the back with purple. It is then often mistaken for the larva of *N. dictæoides*, but no one who has ever seen the real larva of this latter insect, can afterwards confound the two. It is quite smooth, very glossy, and of a beautiful deep purplish brown, with a bright yellow stripe on each side. The brown larva of *N. dictæa* is studded all over with numerous indentations which, though it is glossy, give it a rough wrinkled appearance. It has no stripe on the side, and the dorsal protuberance, and the warty horse-shoe plate on the anal segment, are much smaller than in *Dictæoides*. These brown larvæ are, so far as my experience goes, when first hatched green, and do not turn colour till about half-fed. When young the dorsal protuberance has the

appearance of a single red tubercle. The larva feeds on various species of poplar, and sometimes, though rarely, upon willow. Various entomological authors mention birch as one of its food-plants, but I am convinced wrongly. I have been in the habit for some years past, of taking both egg and larva on a moor in Derbyshire, where both aspen and birch grow freely intermixed; but though I have beaten and examined each carefully and repeatedly, I never found a single *Dictæa* upon birch, nor have I ever heard a single authenticated instance of its being found upon that tree.

Mr. Stainton, in the "Manual," mentions September as the only month in which the larva is to be found; I can only say that I have several times found it full-fed as early as July, and as late as November. I have also had the larva full-fed in July, from eggs found in June, and in both these instances the perfect insect appeared in August. I thence come to the conclusion that the insect is most undoubtedly double-brooded, and it is a perfect marvel to me how any experienced entomologist can for one moment doubt the fact. Mr. E. Shepherd, "Zoologist," vol. xiv., page 5293, says in reply to Mr. Naish, that in order to *complete* the chain of evidence in favour of the double-broodedness of *Dictæa*, it must be proved that the May moths are the parents of those found in August. Now if I find a full-fed larva in July, common sense tells me that the egg which produced it must have been laid in May or at the beginning of June. My larva spins up, and the perfect insect appears in August. Therefore the moth which laid the egg in May, is the parent of the one which appeared in August. Mr. Gascoyne tells us, "Zoologist," vol. xv., page 5826, that at the end of July, 1857, he took a full-fed larva of *Dictæa*; it spun up and produced a female moth at the end of August. He put it out of doors, and a male was immediately attracted, and on the 29th. of August, she was busily depositing her eggs. The chain of evidence is therefore complete, and according even to Mr. E. Shepherd, *N. dictæa* is double-brooded.

In September, 1857, my friend Mr. Bree, had full-fed larvæ and pupæ of *Dictæa*, reared from eggs laid by a moth bred from eggs laid by another moth in May. Both these insects were bred by Mr. Naish. As this, however, took place in confinement, I shall, I suppose, be told that it is no argument in favour of my theory, as the larvæ being deprived of their usual quantum of air and exercise, were obliged to take to premature development by way of amusement. When you find a larva full-fed in July, and it immediately spins up, it cannot in the least signify whether the pupa be kept in-doors or out, for the difference of temperature is so slight, that it cannot make more than a few days difference in the appearance of the perfect insect. I have also no hesitation whatever in saying, that as far as my own experience goes, confinement does not make any material difference when the larvæ are reared from the egg. Were this the case, Mr. Stevens and myself would have bred some autumnal specimens of *N. carmelita* and *N. cucullina*, in 1854; we had then each a brood of eggs in May, and our larvæ were full-fed and spun up long before the usual time; my *Cucullinæ* were all spun up the first week in July, and in the wild state the larva is generally not full-fed till September, yet not a single moth appeared till about the usual time

the following year; but in the case of *Dictæa* and *Camelina*, both Mr. Naish and Mr. G. Harding, of Stapleton, and myself, found our May eggs produce perfect insects in August.

My friend Mr. Greene's remarks about his want of success in forcing the pupæ found in August, afford a strong additional argument in my favour. He found pupæ of *N. dictæa* and *Camelina* in August, and tried to force them, but failed—and why? Because they were not the produce of eggs laid in May, but at the end of June or in July, and were not intended to appear till the following spring. My *Camelina* eggs were laid in May; I kept them in confinement, it is true; they had but little air, I admit; exercise they did not want, for the larva of *Camelina* is one of the most sluggish animals alive, and will stick for hours without moving, with its head and tail up in the air. I did not force them, but half-starved them instead, and yet the perfect insects appeared in August, and were as fresh-coloured, and the females as full of eggs as the spring brood. Mr. Naish had the same result with *Dictæa*, or rather he was more successful, for his moths paired and laid eggs, from which larvæ were reared. My worthy friend, Mr. Greene, also says that he has never dug up the pupa of *Dictæa* in July, but Mr. Gascogne and myself have both taken the larvæ full-fed in that month. It is therefore quite clear that it must turn to pupa somewhere, and if Mr. Greene will read the description of *Dictæa*, in vol. iii. of "L'Histoire Naturelle des Chenilles," he will find what may be a solution of the enigma. M. Duponchel there remarks of this larva:—"We find it at *two* periods of the year—in June and at the end of September. The first brood complete their transformation in a soft yellowish grey cocoon between the *leaves*, and produce moths in July; the second brood *enter the earth* in order to turn to pupa, and do not produce the perfect insect till April or May of the following year."—"On la trouve à deux époques, en Juin à et la fin de Septembre; celles de la première génération se métamorphosent dans une coque molle d'un gris jaunâtre entre des feuilles, et donnent leurs papillons en Juillet et Août; celles de la seconde entrent dans la terre pour se chrysalider, et n'arrivent à l'état parfait qu'en Avril ou Mai de l'année suivante."

In opposition to the double-brooded theory, instances have been quoted of the eggs of *A. herbida* producing the perfect insect in October and November; and similarly those of *A. caja*. I have also myself bred *Sm. Populi* in December, and have seen *H. pisi* bred in the same month; but these do not appear to me to be at all cases in point. These insects did not pair, and they appeared too late to do any good, if they had done so. Besides they were mere isolated instances, whereas in the case of *N. ziczac*, *Camelina*, and *dictæa*, the same result occurs year after year, and in all broods, and in plenty of time for the larvæ to be full-fed before the leaves fall. I once bred some *N. dictæa* in October and November, from autumn larvæ, but in this case I had no doubt whatever that, like Mr. Doubleday's *A. herbida*, they were premature specimens, and the ♀s were to all appearance barren.

I do not for a moment dispute what my friend, Mr. Greene, says with regard to the same batch of pupæ of *Dictæa* and *Camelina* producing moths from May till July. In the case of *Dictæa*, *Dictæoides*, and *Dromedarius*,

I know from my own personal experience that it is so, but this does not at all militate against my double-brooded theory. All I say is this, *N. dictæa*, *Dictæoides*, *Dromedarius*, and *Camelina* lay eggs in May, or the first week in June, which hatch and produce perfect insects in August; and these latter are fertile. In the case of *Dictæa*, they have been seen to pair and lay eggs, which have again produced full-fed larvæ in the autumn, and this has taken place out of doors as well as in. I also say that, as far as my own personal experience goes, confinement has little or nothing to do with this so-called abnormal state of things. Finally, after carefully weighing the *pros* and *cons*, I can come to no other conclusion than this, that both *Camelina* and *Dictæa*, *Ziczac*, *Dromedarius*, and *Dictæoides*, are naturally double-brooded. I will give my reasons for including the three last-named; when I come to them. When I wrote my papers on this subject, in the "Zoologist" for 1856, my assertions were made entirely on my own experience; since then Mr. Harding, of Stapleton; Mr. Naish, of Bristol; and Mr. Gascoyne, of Newark, have devoted themselves to the investigation of the subject, and it is peculiarly gratifying to me, to find all my assertions so fully corroborated and confirmed by the results which have crowned their efforts. It was only the other day that my friend, Mr. Bree, lent me M. Guenée's and Duponchel's work, to which I have previously referred, and there too I found, to my no small delight, all my assertions confirmed. With such an authority to back me, I feel as if I could face all my opponents, even though their name be Legion. (C.)

(To be continued.)

A LIST OF THE RARER SPECIES OF COLEOPTERA, WHICH OCCUR, OR HAVE BEEN TAKEN IN THE NEIGHBOURHOOD OF HARLESTON, NORFOLK.

BY J. LEEDES FOX, ESQ.

AND IN THE NEIGHBOURHOOD OF BUNGAY.

BY W. GARNES, ESQ.

[When no initial is affixed the insect has been recorded by each of the above gentlemen. The initials F and G respectively intimate that it has been observed only by the person to whom the said initial refers.]

(Continued from page 18.)

Triplax russica.—Occasionally.

Monotoma picipes.—Occasionally.

Rhyzophagus depressus.—Occasionally.

R. bipustulatus.—Rare. (G.)

Dorcas parallelipipedus.—In old ash trees. (F.)

Sinodendron cylindricum.—Scarce. (F.)

- Bolbocerus mobilicornis*.—Once taken by Mr. Muskett, several years ago. (F.)
Aphodius hæmorrhoidalis.—Frequent. (F.)
A. emarginatus.—Rare. (F.)
A. porcus.—I have taken this once. (F.)
A. granum.—Rare. (F.)
Agrilus viridis.—Occasionally in Gawdy Hall Wood. (F.)
Oömorphus concolor.—Rare. (G.)
Onthophilus striatus.—Rare. (G.)
Hister parvus.—Rare. (G.)
Teretrius picipes.—(G.)
Melasis buprestoides.—Once in Gawdy Hall Wood. (G.)
Elater bipustulatus.—Rare.
Hypolithus riparius.—Frequent in floods.
Cryptohypnus 4-pustulatus.—Rare. (G.)
Ctenicercus tessellatus.—Frequent.
C. metallicus.—Rare.
Cardiophorus equisiti.—Occasionally. (G.)
Aplotarsus quercus.—Rare. (F.)
A. rufipes.—Occasionally. (G.)
Tillus elongatus.—Occasionally.
Telephorus clypeatus.—Frequent. (F.)
Malachius bituberculatus.—Occasionally. (F.)
Thanasimus formicarius.—Occasionally. (G.)
Necrobia rufipes.—Frequent. (F.)
Ptinus pecticornis.—In an old floor in my house; I found this insect in the summer months. (F.)
P. imperialis.—Occasionally.
P. rufipes.—Occasionally. (G.)
P. 6-punctatus.—Occasionally. (G.)
Ochina ptinoides.—Frequent among ivy on oaks in Gawdy Hall Wood. (F.)
Rarely. (G.)
Tomicus bidens.—Rarely. (G.)
Cis bidentatus.—Frequent in Boleti. (F.)
Bostrichus capucinus.—Three specimens of this rare insect were taken by Mr. Muskett in this town some years since. (F.)
Hylesinus crenatus.—Under bark of old ash trees. (F.)
H. scaber.—Rare. (G.)
Dendroctonus piniperda.—Rare. (F.)
Hylastes rhododactylus.—Old broom stumps. (F.)
H. piceus.—Rare. (G.)
Cionus Blattariæ.—Occasionally. (F.)
Cossonus linearis.—Once abundantly. (G.)
Gymnætron Beccabungæ.—Rare. (G.)
G. Veronicæ.—Rare. (G.)
Nedys Sisymbrii.—Sometimes plentifully.
N. ovalis.—On thistles in autumn. (F.)
N. Echii.—Frequent in the Echium. (F.)

- N. horridus*.—Rare. (F.)
Rhinonchus 4-tuberculatus.—Scarce. (F.)
R. tibialis.—Rare. (G.)
Bagous lutulentus.—Rare. (F.)
Pachyrhinus 4-dentatus.—Scarce. (F.)
P. 4-tuberculatus, (*4-nodosus*? Ed.)—Rare. (G.)

(To be continued.)

ON THE CLASSIFICATION OF INSECTS.

BY THE NORTHERN ENTOMOLOGICAL SOCIETY.

At the last quarterly meeting of this Society the Secretary, rather ungraciously we think, read a private letter from our friend, the Rev. J. Greene, suggesting that their proceedings should be published in this Journal as well as the "Zoologist;" a request which the meeting is reported in much the same spirit to have declined. Now we apprehend that the only motive the Editor of a Journal can have, in expressing a desire to publish these proceedings, is that of a desire to promulgate useful scientific information, and to assist the praiseworthy efforts of a body like this in diffusing knowledge.

If there is an obligation incurred on either side, we think it is almost entirely on the part of the Society, as such reports are frequently very dry reading, and occupy much space. As a proof of both these statements we refer to the ten pages and a half of the report in the February number of the "Zoologist." With the exception of the very useful paper on "Specific Distinctions," by Mr. Constantine, which only occupies a couple of pages, we do not see anything we should have been particularly anxious to publish. The list of insects exhibited cannot have much interest to those who did not see them; and the long paper by Mr. Cooke, on "Classification," as inculcating most erroneous views upon the subject on which it treats, we should think rather injurious than otherwise. We propose to take a short notice of this paper. Mr. Cooke considers that all insects should be classed according to their metamorphosis, and that the orders should be arranged, to use his own words, so as to exhibit "a gradation from a hard-bodied, strong, and well-defended insect, to a soft-bodied, weak, and defenceless one."

No one, we believe, would deny, since the subject was handled by such men as Leach, Oken, MacLeay, and Burmeister, that the metamorphosis of insects must form an important element in their classification. But we certainly little expected to find in these days any one attempting a system based on this character alone. As Burmeister has well observed,—“We thus (by the metamorphosis) obtain two chief groups among insects, which we distinguish as *Insecta ametabola* (imperfect metamorphosis) and *metabola* (perfect metamorphosis.) Both commence a new development in the organization of the mouth.....Thus each group has *Insecta haustellata* and *Insecta mandibula*. Each of these groups may be farther subdivided, according to the form of the larva, the structure of the wings, and the entire internal organization; and these constitute their orders.”

We believe the above quotation to contain the only sound principles upon which the Classification of Insects can be attempted. These principles, as Burmeister observes, are deduced from the idea of an entire insect, and he places the orders thus, from the lowest to the highest:—

AMETABOLA.—*Hemiptera*. *Orthoptera*. *Dyctyoptera*.

METABOLA.—*Neuroptera*. *Diptera*. *Lepidoptera*. *Hymenoptera*. *Coleoptera*.

Mr. Cooke, however, copying Dallas, places the *Diptera*, which have two wings and apodal larvæ, before the *Lepidoptera*, which have four wings, attain a great size and strength, and whose larvæ are highly organized!

He then separates the *Trichoptera* from the *Neuroptera*, and constitutes them into a distinct order, including the *Panorpideæ*, *Raphidiidæ*, *Hemerobidæ*, *Sialidæ*, and *Phryganidæ*, and places them among the METABOLA, while he classes the rest of the family as *Neuroptera* among the *Hemimetabola*.

The second view which Mr. Cooke propounds in his system of classification, is that all predaceous insects should be placed at the top of each order, and the weak and defenceless ones last. In the very outset, however, Mr. Cooke meets with a fatal difficulty. He gets over it, however, in a manner not very ingenuous. Of course if the principle is good as to insects, it must apply to the other classes in animated nature, and Mr. Cooke observes,—“Thus in *Mammalia* the lion, the tiger, the leopard, etc.; in the birds the eagles and falcons will claim the highest rank; and indeed such is the position, or nearly so, commonly assigned them.”

So thinks Mr. Cooke. Cuvier, however, who must be permitted to have known something of Zoology, placed the bimana, the quadrumana, the cheiroptera, (bats,) and the insectivora, (the moles and shrews, etc.) all before the carnivora. We apprehend most Zoologists will think Cuvier right.

In attempting to carry out his views in the arrangement of the orders in the class *Insecta*, Mr. Cooke is not more successful. The *Coleoptera* placed by almost every systematist from Aristotle to Dallas, at the head of the class, is of course a favourable starting-point. The *Geodephaga*, a predaceous family, is at the top. But this is evidently not solely on account of their carnivorous nature, but because as a whole they form a type of the order. The *Scarabæidæ* have as great or greater strength. The *Lucanidæ* far exceed them in size, are “harder-bodied,” and more strongly defended. The *Staphylinidæ* are a strong, active, predaceous race: and the larvæ of the *Coccinellidæ* and others are highly carnivorous, and yet they are all placed far below the *Geodephaga*.

In the *Lepidoptera* Mr. C. thinks the *Papilionides* properly placed, but he expresses this correct thought at the sacrifice of his own principles; for surely *Sphinx*, *Acherontia*, or *Cossus* are much stronger, harder-bodied, and better defended than the soft and gentle butterfly? while many of the larvæ of the *Noctuæ* are well-known cannibals—such a charge, we believe, never having been preferred against a *Papilio*. The *Hymenoptera* deserve a second place according to Mr. Cooke, because one of the family supplies us with “wax and honey.” We take the liberty of urging a similar claim for *Bombyx mori*, which supplies us with silk.

When he arrives at the *Diptera* Mr. C. becomes indignant, and hurls a

missive at Mr. Walker, from the effects of which, we fear, that able naturalist will hardly recover. "It would be just as rational to place a *rat* at the head of the *Mammalia*, as a domestic nuisance like the *flea* at the head of the *Diptera*!" Mr. C. is unlucky in his simile, for Cuvier places the shrew, which is a more insignificant creature than the rat, before the lion or the tiger; and the flea is placed among the *Diptera* upon Mr. C's. own principles, namely, the analogy of its metamorphosis to that of the *Tipulidæ*.

In the *Neuroptera* Mr. Cooke's difficulties increase, for he has actually added four families of smooth-winged, true *Neuropterous* insects, to the only hairy family, the *Phryganidæ*, under the order *Trichoptera*! but the reason for this innovation becomes apparent when we remember that the above four families are carnivorous.

We think we have said enough to convince our readers that Mr. Cooke's attempt at a Natural System of Insects is most unfortunate. We do not think papers like this are likely to advance the science of Entomology. On the contrary, we think they do much to give foreign naturalists an unfavourable impression of the philosophic tone of thought which prevails in this country. We are sorry to see that the Curator of the Warrington Museum has announced that he has arranged the insects of that Institution upon Mr. Cooke's "hard and soft" system.—ED.

A LIST OF THE INSECTS OBSERVED IN THE SOUTHERN PART OF THE COUNTY OF SUSSEX.

BY W. C. UNWIN, LEWES.

NO. III.—INCLUDING THE STRATIOMIDÆ, TABANIDÆ, AND ASILIDÆ.

(Continued from page 41.)

STRATIOMIDÆ.—WESTWOOD.

Beris clavipes.—Appears to be rare. Found in July by sweeping in meadows near Kingston, and on Hamsey Common.

B. vallata.—Not common. Obtained by sweeping aquatic plants, by the sides of ditches in the Lewes Levels, in July.

B. chalybeata.—Rare apparently, but probably only so from our not having discovered its metropolis. Taken in a rough field near the Plashet Wood, in June, 1855.

Stratiomys longicornis.—Rare. Taken off *Umbellifere* in Oxsettle Bottom, near Mount Caburn, in July, 1854; and again in the same locality last summer.

S. chamæleon.—Very uncommon in this district, although it is said to be one of the most abundant of the genus in some localities. A very interesting account of this insect, on its preparatory state, is given in Mr. Dallas's "Elements of Entomology."

S. argentata.—Rare. Taken near Seaford, on the coast, off the Wild Carrot, (*Daucus carota*), in July.

S. tigrina.—Of frequent occurrence, and examples are often met with in our entomological rambles during the summer months.

S. viridula.—May be said to be common. It is very partial to the flowers of the Marsh Thistle, (*Carduus palustris*,) in the Lewes and Newhaven Levels, in July. It delights in the hottest sunshine. The beautiful green of the abdomen, which is so bright in living specimens, generally fades into a brown after death.

Oxycera trilineata.—Rare. In my own garden in July.

Nemotelus uliginosus.—Not uncommon in the Lewes and Pevensey Levels, and frequents the flowers of Marsh Ragwort, (*Senecio aquaticus*,) in July. It is a somewhat sluggish and inactive insect.

N. pantherinus.—Not so common as the preceding, but associates with it, and is found in the same locality and at the same period. Both species are very beautifully marked insects, with their almost invisible transparent wings. They appear to be invariably marsh species.

Chrysomyia formosa.—Common. A very beautiful and distinct species, occurring very generally in this district, and rather plentifully from June till September. It is very fond of settling and basking on the leaves of shrubs in hedges and gardens.

C. polita.—Equally common with the last species; its habits are similar, and may be found in the same localities. The ♂ and ♀ vary a little in point of colour—from a golden green to a tinge of copper-colour, and having the violaceous tinge in the female.

Sargus cuprarius.—This common but beautiful insect is ornamented with brilliant metallic colours. It is very inactive in its habits, and appears to delight to rest on the foliage of plants, rather than on their blossoms. It affects pleasure-grounds and gardens, and may frequently be seen in the neighbouring lanes enjoying the sunshine, from June till August.

S. nebulosus.—Common in this district, but so closely allied to the last species, that I almost doubt if it is not only a variety; its habits and the localities it frequents are the same.

S. bipunctatus.—Once taken near Ilford, in August, 1855, but it does not appear to be so general as the two preceding species. It is equally beautiful in colour.

TABANIDÆ.—LEACH.

Tabanus bovinus.—Rare, and by far the largest and most conspicuous of the British *Diptera*. Taken occasionally on the Downs frequented by cattle, near Rottingdean, Kingstone, and elsewhere in this district, in August and September.

T. autumnalis.—Very common generally, and usually appears in the hot months of July and August, and indeed throughout the autumn, from whence no doubt its specific name. The *Tabani* are generally known by the names of Breeze or Horse-fly. All the species are of a very strong and robust form.

T. tropicus.—Less common than *Autumnalis*, although not of unfrequent occurrence near Lewes and the immediate neighbourhood, in July and August. Usually found settling on the ground in unfrequented pathways, enjoying in

common with many of the *Diptera*, the heat of a summer's sun. It has on one or two occasions been taken off the early blossoms of the ivy.

T. luridus.—Rare. It has occurred near Ashcombe, near Lewes, and at Firle, in the autumnal months.

T. rusticus.—May be considered rare in this district, having been taken only on one or two occasions. In some of the other counties it is reported as being one of the most common species inhabiting this country.

Hematopota pluvialis.—This insect occurs in plenty generally, and more particularly in the Weald of Sussex, on the forest district of Tilgate and Ashdown, in July and August. It is very troublesome, and is most persevering in its attacks.

Chrysops cæcutiens.—Not by any means common, although it has frequently been taken in the Lewes Levels, in July and August, settling on cattle when grazing.

C. relictus.—Scarce. Once taken at Firle, and near Lewes in July. This insect does not appear to be so common in England as the preceding species, but it is said to be common in the north of France.

ASILIDÆ.—LEACH.

Asilus forcipatus.—Not uncommon. Has been found at the foot of the Downs near Lewes, and also near Rottingdean.

A. aestivus.—Rare. The borders of corn-fields in Oxsettle Bottom, near Mount Caburn, on *Umbellifera*, in June.

A. crabroniformis.—This very fine and handsome species occurs more frequently than either of the others, and generally is met with on the Downs, and mostly in pairs in the month of August. It is a strong and powerful insect.

Dioctria flavipes.—Of frequent occurrence on *Umbellifera* on sunny banks in the neighbourhood of Lewes, in June and July.

Leptogaster cylindricus.—Occasionally taken in this district, but not common.

(To be continued.)

IN the last number of "The Naturalist," Mr. Morris makes a few remarks on my method of setting Lepidoptera. He objects, in the first instance, to the sizes of the pins which I recommend. This must ever be a matter of taste with each individual collector, and Mr. Morris is, of course, at perfect liberty to use the sizes he prefers himself, but when he recommends to his readers the total abandonment of Nos. 11 and 12, and the adoption in their place of No. 13 only, I would ask him whether he possesses such insects as *A. atropos*, *S. ligustri*, *S. convolvuli*, etc. In my specimens of these species, the head of a No. 13 pin would disappear in the thorax. I cannot but think that Mr. Morris stands alone in recommending such a size only. He complains, secondly, that I have omitted to state, for the benefit of beginners, the proper depth of the boards. I should have thought Fig. 3 would have explained this knotty point with sufficient clearness for the comprehension even of a child.

Mr. Morris farther remarks, that my plan is not a new one, (I never said it was,) except as to the way of first moving the wings forward by means of a piece of wetted paper. This is no part of my plan; my words are, "move up the fore wing to the required height, and having a little slip of paper on the moistened tip of the middle finger of the left hand, hold the wing with *it* by the apex, in this position; then, etc." The pressing the wing gently down with pin D, is the only part of my plan for *which* I claim the merit of novelty, and very possibly I may err in asserting even thus much. Whether any comparison can justly be instituted between my method and the slovenly one of sticking a pin through the wings, I must leave to my readers. Lastly, Mr. Morris says I do not mention the method of setting with cotton thread, adding, "the effect (of this method) is better, and the process more quickly performed." I emphatically deny both these assertions. With regard to the *effect*, leaving the vexed question of curved or flat wings untouched, the system recommended by Mr. Morris utterly destroys the beauty of many insects, as the clear wings, *L. rubricollis*, *T. W-album*, and many other delicate species; the marks made by the threads being quite perceptible. With regard to *speed*, I will readily undertake to set twelve *Noctuæ* according to my method, in as short a time as can be done by any other. When I say this, of course I mean that both parties' insects are to be equally WELL set; not in that hasty careless way which necessitates the *re-setting* of five-sixths of the insects you obtain from your correspondents.—J. GREENE, 32, Lower Pembroke Street, Dublin.

C. dispar.—I must again request Mr. King to explain about *C. dispar*. His so-called explanation in "The Naturalist" for March, only makes confusion worse confounded. Mr. King puts himself into a worse position than ever, and into the bargain proves that Mr. E. Newman made a blunder in 1857, and a gentleman in Horning Fen told an astounding falsehood in 1856. In "The Naturalist" for January, Mr. K. advertises *C. dispar* for sale, together with a lot of other insects, and distinctly states that they were *all taken during the past season in the fens, etc.* In "The Naturalist" for March, he says the *C. dispar* were *not taken last year at all*, but many years ago, and on Whittlesea Mere, and not by himself, but by an old collector now dead. If Mr. K. can unravel this tangled skein, I hope he will.—H. HARPER CREWE, Stowmarket, March 6th., 1858.

Review.

Histoire Naturelle des Insectes. Lépidoptères. Tome X. Uranides et Phalénites. Par M. A. GUENÉE.

THE second volume of this important work is now before us, and we are enabled to give our readers a brief abstract of the changes which it proposes in our list of British *Geometræ*.

The volume begins with the termination of the large family ACIDALIDÆ, the only remaining British species of which we find our old friend the "Blood-vein," which is now placed in the genus TIMANDRA, Dup., that of BRADYEPETES,

Steph., being sunk. The three species of *Timandra*, of Doubleday's Catalogue, are absorbed into the genus *ACIDALIA*. In the small family of *CABERIDÆ* the genus *CABERA* remains as in Doubleday, with the exception of *STRIGILLARIA*, which is removed to the genus *ASPILATES*. The generic name, *BAPTA*, Steph., is sunk, and that of *CORYCIA*, Dup., substituted; while *PICTARIA* remains as before, the sole representative of the genus *ALEUCIS*, Gn. The family *MACARIDÆ* is not altered.

In the family *FIDONIDÆ* we have, 1.—*STRENIA*, Dup. 2.—*PANAGRA*, containing *Petraria*. 3.—*NUMERIA*. 4.—*SCODIONA*, in which we have *Favilla-cearia*, of Hub., under the name *Belgiaria*, Hub. 5.—*SELIDOSEMA*, containing *Plumaria*. 6.—*FIDONIA*, in which we find our old friend *Conspicuaria*. 7.—*MINOA*. 8.—*SCORIA*, containing *Dealbata*. 9.—*STERRHA*? 10.—*ASPILATES*.

Family *ZERENIDÆ*, 1.—*ABRAXAS*. 2.—*LIGDIA*, containing *Adustata*. 3.—*LOMASPILIS*, containing *Marginata*.

Family *LIGIDÆ*, 1.—*PACHYCNEMIA*. Family *HYBERNIDÆ*, 1.—*HYBERNIA*, which remains as in Doubleday's Catalogue. 2.—*ANISOPTERYX*.

The family *LARENTIDÆ* occupies nearly all the rest of the volume. The genera are 1.—*CHEIMATOBIA*. 2.—*OPORABIA*, in which *Autumnaria*, Doubleday, is made a variety of *Filigrammaria*. 3.—*LARENTIA*. 4.—*EMMELESIA*, in which the *Affinitata*, of Stephens, is constituted a distinct species from *Rivularia*, and *Bifasciata* a variety of *Unifasciata*. 5.—*EUPITHECIE*. 6.—*LOBOPHORA*, including *Aecasis*. 7.—*THERA*. 8.—*YPSIPETES*. 9.—*MELANTHIA*. 10.—*MELANIPPE*, which now contains, in addition to those in Doubleday's Catalogue, *Procellata*, *Montanata*, *Galiata*, and *Fluctuata*; *Alchemillata* is constituted a variety of *Rivata*. 11.—*ANTICLEA*. 12.—*COREMIA*, in which *Unidentaria* becomes a variety of *Ferrugata*, and our old friend *Ligustraria* takes its Linnæan name of *Quadrifasciaria*. 13.—*CAMPTOGRAMMA*. 14.—*PHIBALAPTERYX*. 15.—*SCOTOSIA*, which now absorbs *Triphosa* and *Eucosmia*. 16.—*CIDARIA*, which includes the rest of *Phæsyte*, *Steganolophia*, and *Harpalyce*, not previously provided for, except *Chenopodiata*; *Immanata*, Haw., is made a species of *Russata*, W. V.; *Ruptaria* returns to the name given it by Thunberg, namely, *Corylata*; *S. ribesaria* returns to the Linnæan name of *Prunata*; *Achatinata* to that of *Testata*, Lin.; and *Marmorata* to that of *Dotata*. The generic name *HARPALYCE* is altogether dropt. 17.—*PELARGA*, which includes *Chenopodiata*.

The family *EUBOLIDÆ* has genera 1.—*EUBOLIA*, to which is added *Palumbaria*, *Bipunctaria*, and *Lineolata*; *Multistrigaria* is placed in the genus *LARENTIA*. 2.—*ANAITIS*. 3.—*CHESIAS*. Family *SIONIDÆ* has only one genus, *TANAGRA*, containing *Cherophyllata*.

It will be found by this abstract that considerable changes have been effected in the distribution of the *Geometræ*—some genera have been entirely swept away, and the species absorbed into others—many hitherto well-considered species have been constituted varieties merely of allied forms—and many names established by long custom, have been changed for those given to them by earlier systematists.

The object of M. Guenée is of course that of all good classifiers—that of obtaining as far as possible a natural arrangement; and we have to thank

him most sincerely for the able manner in which he has, in the furtherance of this object, abolished useless or ill-founded genera, extended families, and brought allied species more into contact with each other. How far he is correct in some of the cases in which he has sunk species into varieties, time and the *practical* experience of naturalists can alone show. Some of them have been already objected to. They will form good problems for our practical men to solve. It is by breeding the insect that the specific distinction is best established. We must not trust our "opinions" or our "convictions" upon this subject. We must first submit both to the rigid test of practical examination. We have, for instance, a doubt arising merely from our "opinion," whether *C. unidentaria* is a variety of *Ferrugata*. Guenée has made it a variety upon the slight testimony of a figure of *Sepp*, in which both insects are represented as raised from the same larva. *Unidentaria* was established as a species by Haworth, and has been sanctioned as such by all successive writers. It is only found in England, and therefore M. Guenée may not have had the opportunity of studying the species.

A still stronger case of doubt is, we think, that of making *C. autumnaria* a variety of *C. filigrammaria*, and this is another problem we leave our practical men to work out.

In the numerous changes of specific names, we feel inclined, in the strict performance of our duty, rather to find fault with M. Guenée. These changes create great confusion, without, we think, an equivalent scientific advantage. It is eight years since Doubleday's Catalogue appeared in this country, and almost all collections are named by it. This Catalogue, we believe, was formed on M. Guenée's own works, as far as the nomenclature was concerned. There was, we apprehend, as good reason then for calling *H. marmoraria*—*dotata*, and *H. achatinaria*—*testata*, as there is now. Even now the names of Stephens and Curtis, superseded by that Catalogue, are used by many. In eight years more we shall probably have another change, just when we are getting accustomed to know a thing by the name it is called.

We have not space, we are sorry to say, to enter further at present into a critical examination of these volumes. That they will give great satisfaction as a whole, we have no doubt, and that they will add to the already high fame of the author, and remain to future ages as a splendid monument of his zeal and industry, will, we are sure, be the willing testimony of all who examine their pages.—Ed.

Miscellaneous Notices.

A Canine Fox.—A very extraordinary animal has been captured in this neighbourhood by the hounds in Alexton Wood, and is now alive, and in the possession of a surgeon in this town. When discovered, it was surrounded by the hounds, which made no attempt to seize it. It was lying crouched in a ditch, and appeared very thin and exhausted, and whether it had been pursued by the hounds, or had followed them, or had accidentally been discovered in the spot where they came to a fault, (for they

had had a run just before,) does not appear. I am inclined to think its discovery was purely accidental, as, whether a true Fox or not, had the hounds caught it after a chase, they would not surely have let it alone. At first it was very wild, and snapped at every one that came near, but by care and good feeding it has become quite tame, and will follow its master about the yard. I have well examined it with others, and we all are decided in our opinion as to its being a veritable cross between the Dog and Fox. The shape of the head and body is that of the latter animal, but the legs are long and clumsy, like those of a Dog, while the feet, again, and long claws, especially of the hinder pair, are those of a Fox. Its tail is a decided brush, even to the white tip. The ears and eyes are exactly those of a Fox, but the nose, though long and pointed, is not so slim and fine as is usually found in that animal, and partakes somewhat of the canine character. The general colour is foxey, except down the front of the breast and on the fore legs, which are white, as are also the hind feet. The hair is like that of a Fox, especially about the head and back, and the whole animal, which is a full-grown female, distinctly combines the characteristic features of the two species; and, what is most remarkable, from the appearance of the teats, it seems to have lately suckled young itself. No doubt it was brought up in the woods, and its dam was a Fox, for, had it been the offspring of a female Dog, it would never have been allowed to run wild, or been discovered in the state in which it was found.—F. M. BURTON, Uppingham, December 2nd., 1857.

Occurrence of the Otter at Fakenham.—A fine male Otter, weighing twenty-four pounds, was killed near Fakenham, about the middle of January last.—T. SOUTHWELL, Hempton, Fakenham, February 9th., 1858.

A Black Hare.—I had to preserve a beautiful specimen of a Black Hare captured at Merton, the seat of the Right Hon. Lord Walsingham, near Thetford, on December 23rd., 1857.—H. REYNOLDS, Thetford, Norfolk.

Mildness of the Season.—Your note in the last number of the Naturalist respecting the mildness of the early winter in Yorkshire, has induced me to send the following notice to shew the extreme degree of mildness of this mid-winter season in Cornwall. On New Year's Day, I gathered from a garden in Looe, the following flowers:—Nasturtions, two varieties of Roses, Siberian Primroses, Sweet Violets, Venus' Looking-glass, whilst I saw in another garden fine varieties of Fuchsia, Heliotrope, Campanula, Scarlet Geraniums, Scarlet Salvia, Periwinkle, Roses, Mignonette, Ten-weeks' Stock, Pyrus Japonica, all in full bloom, growing without the least protection from the weather, shewing a greater degree of mildness than has ever before been remembered at this season. I also saw during a country ride to-day the following flowers:—Rough Robin in great abundance in every hedge-row, a

field one mass of golden yellow from the abundance of Charlock in bloom, many specimens of Hawkweed, Violets, Daisies, Dandelions, Wild Strawberries, and a flower, the name of which I do not recollect. Should the present mild weather continue a short time longer, we shall have the spring flowers making their appearance before the flowers of last summer have left us—an occurrence, I believe, never before remembered.—STEPHEN CLOGG, Looe, January 2nd., 1858.

A statement has appeared in some of the north-country papers, to the effect that the notes of the Cuckoo were heard in a field near the village of Cleadon, in the county of Durham, on Thursday last, the 11th. February. As this is a remarkable circumstance, and appears to be authentic, I desire to bring it to your notice. Perhaps some of your correspondents may be aware of the early appearance of this migratory bird in former years. If so, I should be glad to be informed *when* and *where*, and whether it was followed by an *early* and *warm* summer. Gilbert White's and Hardwick's calendars both return a later date for the appearance of this bird in the south of England. I may add that the past winter has been a mild and dry one, and at the present time, on a bright afternoon, the trout may be seen to rise at the natural fly in the River Derwent—a further proof of the mildness of the season.—R. BARRINGTON COOKE, Scarborough, February 16th., 1858.

[Mr. Cooke will see other similar instances, *re* the Cuckoo, in my account of this species in my "British Birds." *Re* the trout, I saw one rising last week. It is a regular thing all the winter through in suitable weather.—F. O. M.]

On the last day of the Old Year the Yellow Jasmine was in blossom in the Rectory garden at Sutton-upon-Derwent, near York; and walking home from there, over Allerthorpe Common, the Gorse was in bloom, all the way more or less, for a mile or two—that beautiful blossom which, it is said, Linnæus, on first seeing in this country, fell down on his knees and thanked God for the sight of.—F. O. MORRIS, Nunburnholme Rectory, March 4th., 1858.

Eggs of the Nuthatch.—In the last December number of this journal, in an account of the habits, etc. of the Nuthatch, the eggs are described as being "like the Wryneck's, white," which I think must be an error, as all that I have obtained, agree with the description by Yarrell, vol. ii., page 176, which is, "the eggs are very much like those of the Great Tit, but the spots are generally less numerous and rather larger." But, although the eggs of these two species are similar, there is a marked difference between them when compared together. Possibly by some means the eggs

of the Lesser Spotted Woodpecker may have been described, which are white and very like those of the Wryneck, instead of those of the Nuthatch.—JOHN PORTER, JUN., No 8, East Street, Lewes.

Occurrence of the Alpine Accentor, near Lewes.—On the 26th. of December last, I obtained two specimens of the above rarity, which were shot on the Downs near here.—Idem.

The Water-rail.—Whilst out hunting on Saturday the 12th., I saw the following:—The hounds in trying a thick thorn cover at Walkeringham, in Nottinghamshire, disturbed a Water-rail. It flew a considerable distance, and settled on a thorn by the side of the cover. It suffered a farmer, who was out on horseback, to ride up and cut it down with his whip. It was a fine specimen, but lighter on the back than those I have usually seen.—C. ANDERSON, Lea, near Gainsbro', February 13th., 1858.

A Colony of Sand Martins in a Town.—Although we cannot see the process of incubation, yet there is no lovelier sight in the nidification of our British birds than that of a colony of Sand Martins, whether we consider the confidence which this bird reposes in man, its perilous voyaging, (demandant pardon, Baron Humboldt, etc.,) its evident utility in the economy of Nature, its butterfly-like flight and low twitterings, which, like other aerial songsters, are mute on the ground, as if, as the falconer in Walton's Angler has it, it were "sad to think it must descend to the dull earth, which it would not touch but from necessity." Not the least interesting of these points in its history is the freedom with which it sometimes builds in the vicinity of dwellings, and even busy streets. One of the most remarkable instances of this occurred last summer in this town. In the softer sandstone overlying the rock, laid bare by a cutting in the west end of the town, there have been more than a hundred nests, and, to judge from the numbers of birds haunting the spot, perhaps little short of six hundred Sand Martins were reared in them. This colony is surrounded by paved streets, and a nunnery and a large chapel are in immediate contiguity. There is no water near. From this interesting occurrence it appears that this bird is not of that solitary habit that some have supposed, but that, provided the situation be favourable, it matters nothing whether the nest be "remote from towns" or "in populous city pent." I should observe that many of the holes have been filled up and obliterated by the action of the weather.—HENRY PAYNE, M.D., Nottingham, October 26th., 1857.

The Rev. F. O. Morris will be very much obliged to any of his readers who will send him, this spring, some larvæ or chrysalides of *Atalanta*, *Cardui*, *Fimbria*, *Polychloros*, *Monacha*, and, if possible, *Pieris crategi*; the two last-named to introduce into his neighbourhood.—March 2nd., 1858.

Proceedings of Societies.

Thirsk Natural History Society.—The monthly meeting of this Society was held on the evening of Monday, the 1st. of February. The following Botanists were duly enrolled as members of the Exchange Club:—B. Carrington, M.D., Yeadon, Leeds; T. W. Gissing, Wakefield; W. L. Lindsay, M.D., Perth.

Mr. J. G. Baker read a paper on the British species of *Delphinium*, in which he referred to *D. Ajacis*, the plant figured in English Botany as *Consolida*, and stated that he was not acquainted with the true *Consolida* as a British plant. He also announced the discovery in the Carnarvonshire Highlands, by one of the Snowdon guides, of *Dryas octopetala*, a plant previously known in Britain only in Scotland and Yorkshire.

Mr. J. H. Davies read a paper from Dr. Carrington, of Yeadon, enumerating five mosses new to the Isle of Man, and announced the discovery, by Mr. Marratt, of a supposed new species of *Bryum*, (*B. cochlearifolium*, Wils. MSS.) in the neighbourhood of Liverpool; by Mr. Nowell, of *Lepidotodon Smithii*, in Borrowdale; and by Mr. Croall, of *Andreæa grimsulana*, on Ben-na-macdhui.

The Querist.



Does the Tortoise produce eggs in this country?—Early in November a bird-stuffer in Fakenham, had a Tortoise brought to him which had died in confinement. Upon removing the body in order to clean the shell, he found it to contain a number of eggs, some of which were in a very advanced state; the shell of one which I have appears quite perfect, and must have been fit for exclusion. I was not aware that the Tortoise ever produced eggs in this country, and shall be glad if any of your readers, who are better acquainted with its history than myself, will inform me whether this is an unusual circumstance—to be attributed, perhaps, to the long, hot, and dry summer, or whether such instances often occur.—T. SOUTHWELL, Hempton, Fakenham, Norfolk, January 2nd., 1858.

[Can Mr. Southwell state whether the Tortoise had been for a long or a short time in this country, and whether it had been “solus,” or rather “sola,” or not?—F. O. M.]

Can any of our entomological readers tell me the money value of *Cassiope*, *Blandina*, *Artaxerxes*, *Arion*, *Bembeciformis*, and *Fuciformis*?—F. O. MORRIS.

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it is not young people merely who are taken captive by this book. We have lately met with two instances in which it has exerted a similar influence over persons in advanced life, and devoted to pursuits which might be supposed little calculated to leave room for any enthusiasm on behalf of insects. In one case a learned friend of ours, who had just been exploring, and with good results, the dusty Syriac MSS. of the British Museum, was so delighted with the book, on dipping into a copy which accidentally fell in his way, that he straightway purchased one for himself, read it with avidity, and has since become a most industrious collector. The other instance was that of one of our most popular metropolitan clergymen, who, having had occasion to refer to the book for the elucidation of some passage of Scripture relating to insects, was so deeply interested in what he read, that he publicly recommended the work from the pulpit, with a warmth of commendation which somewhat surprised his hearers."—TITAN, Nov., 1857.

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BY C. R. BREE, ESQ.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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THE GAIT OF BIRDS.

BY O. S. ROUND, ESQ.



HAVING considered in former papers the sounds which birds are capable of uttering, the food upon which the several kinds subsist, and their mode of locomotion in the air, that medium for which, with only a very few exceptions, they are peculiarly fitted by Nature, I shall now proceed to discuss a faculty for which they are not so peculiar, but which they possess in common with all animals, namely, locomotion upon the earth's surface. Man has a foot most exquisitely adapted for the preservation of his erect position, notwithstanding any inequality of surface; and in a wild or savage condition, his powers of leaping, running, or climbing, or of endurance in all these, is little inferior to that of the majority of animals, having regard to his bulk, and the formation of his limbs; hence his general qualifications are not so remarkably developed as that of other creatures, to which a particular mode of life is assigned, and which are proportionably endowed for that one, and awkward when endeavouring to exercise any other, for he can excel to a certain degree in all.

Birds more resemble animals in this particular, for, whilst the greater number are perchers, and peculiarly fitted for living in trees, sitting on the twigs or branches; others are formed for swimming, others for wading, which are partial swimmers; and others, which are by far the smallest number, for exclusive movement upon the earth itself. Three of these divisions are very familiar to us all; thus we all know the Sparrow or the Redbreast, which are perchers, (although the latter has more of a running leg too;) we are equally familiar with barn-door fowls or the Lark tribe, which are walkers or runners, (the latter, however, being scarcely runners,) and have seen the common Goose or tame Duck perform the action of swimming; but the waders, of which the Common Snipe is an example, are not so well known, being wild birds, and seldom or never the subjects of domestication.

Among the first division of perchers are included all the Finches, the Creepers, the Thrush kind, and all the birds of prey, although, strangely enough, some of these build on the ground. The greater proportion of the insectivorous birds are also perchers, indeed they all perch without exception; but there are a few which have the faculty of walking or running, which is possessed by none of the others, for these others, when on an even surface, hop and do not move one leg before the other; thus the Wagtails walk and run, and are the smallest birds that do so. The granivorous or seed-eating division are also capable of perching, and are pure perchers, with the exception of the *Gallinulæ*, which order includes the domestic fowl and birds of game, (except the Wood Grouse,) and the

Larks, which all walk; then in the marsh birds, which are partially aquatic only in their habits, there are the Peewit and Land-rail, which are good runners; then the Bustards, which are now confined, however, within a very narrow limit, and these are so fleet as nearly to distance a horse, and were anciently chased with dogs. Our Stone Curlew, (*Charadrius Ædic-nemus*), and the foreign Ostriches are instances of the same speed of foot, and the Woodcock and Quail more moderate in their powers, but still able to run and walk. I have merely specified the birds of game as instances, but there are among them some which are unrivalled in speed of foot for their size; I more particularly refer to the Partridge, but the Peacock, Turkey, and Guinea-fowl are likewise endowed with this faculty.

Of the birds of prey, all are, indiscriminately, perchers, and almost incapable, from the formation of their feet, which are the chief instruments by which they take their prey, of moving on a flat surface. The Willow Wrens, the Titmice, the Woodpecker tribe, and all our summer visitants, are also perchers; but then the Pigeon tribe, although they cannot run, walk very respectably; even among the pure perchers there are great modifications; thus, the Swallow tribe, although they cannot move to any extent on the ground, are also incapable of performing any evolutions of activity on trees or buildings; this is also the case with a great many of the perchers, among which we may include Hawks and Owls, the Cuckoo, the Chats, and the Common Bunting; and although the Thrush and Pie kind are remarkably active among the branches of trees, the Starlings seldom stir from one position; and the Raven, Rook, Crow, and Jackdaw are much more fond of quiescence when perching than of hopping from bough to bough. These, however, all walk, though they cannot run. The Creepers have feet which are a sort of compromise between the walking and clutching formation, and move on the face of the bark of trees with extraordinary facility. Some, as the Nuthatch, move in all positions, up and down, but he takes a wider range, being also a percher, but the rest of his order never perch.

Now, among the water-birds, by far the greater number are runners, for all the waders are runners also; and as their mode of life is much more uniform than the land-birds, so when we come to consider their habits in the mass, we always find the matter very much simplified. Thus it may be stated broadly that all the waders which are of the Snipe or of the Gallinule genus are walkers and runners, some very good, others with a web on the foot partially developed, are greater adepts at swimming and diving. The former, which are shore or marsh birds, are perhaps the best examples, for the Common Gallinule, or Moorhen, is indeed a bad example, for, like many of the same kind, his toes are too long to render him a good pedestrian in proportion as they assist him in his natural element.

All the Duck tribe are almost incapable of running; some indeed, such as the longer-legged ones, waddle along with considerable dispatch; but this movement is so ungraceful and forced, as hardly to deserve the name. There are some of these, such as the Coot or Grebe genus, which have the legs placed so far behind, as to be almost purely aquatic, which hardly walk at all from mere inability to escape if caught upon a plain. These have not their feet entirely webbed, but palmated, that is, with circular flaps of skin attached to the sides of their toes, and little or no hind toe; this is however the case with the Stone Curlew and Peewit. There is also a sort of link between the Duck tribe and the waders, which have the webbed foot of the former, but the long leg and the same form in body as the latter; thus the Dotterels and the Turnstones are web-footed but active birds, and connect both characters. The water-birds contain some perchers, for all the aquatic Falcons and Eagles are of course endowed with powerful talons; the Crane and Stork are also water-birds, and the Heron tribe are always classed among them: these two orders are very powerful runners, being of a high lean figure, with very long legs.

There is a very large family of marine birds which are included under the name of Gulls; these are almost as numerous as the Snipe genus, and are as distinctly marked in their appearance; all these are light birds, and run tolerably well, as do those which bear a modified resemblance to them, as the Avocet, the Spoonbill, the Olive or Oyster-catcher, the Terns, and the Petrels.

Now the Divers I consider as possessing much more alertness than the Duck tribe in general; they are of a sharper shape, and formed entirely for aquatic evolutions, cutting a very poor figure on shore. The feet of these birds are most beautifully adapted for expedition in the water, being so constructed as to present the largest possible surface to the water in the stroke, and the least in drawing it back to take another: this arrangement of folding up I shall probably descant upon more particularly hereafter. The Gannet is a bird which very much resembles the Divers, but he is a very much better walker, although he cannot run. The Cormorants and Darters are still further removed from the Duck tribe in appearance, and yet still retain the webbed foot and plumage capable of resisting the water: these are all indifferent walkers. The Darters are, I suppose, the most expert swimmers and divers of all birds.

The climbing birds have some analogous species, which, although they cannot run or make any dispatch on the bodies of trees, yet have a habit of clinging to the smaller twigs or branches whilst feeding; these are all perchers, and include the Titmice and the Aberdevine. The Crossbills also use their bills in aid of their feet, in holding their food; in this they resemble the Parrots, as in many other particulars. It is a curious fact

that the Creepers, although they seldom use their wings, if those members (the wings) suffer damage, will not adhere to the body of a tree if placed upon it, although when so young as to be unable to fly, they constantly leave the nest, and crawl all over the body and limbs of the tree in its neighbourhood.

There is yet one other class of birds which I shall advert to, and this is the Auks and Penguins, which can scarcely be said to have any powers of locomotion whatsoever. If it were not for the conviction which every man who is a believer in the Omnipotent Wisdom of the Creator must possess of the admirable fitness of every class of beings, for their appointed mode of life, these creatures must become objects of our pity, so helpless do they appear; but the truth is, they are only fitted for one element, although perfectly so as to be birds to all intents and purposes; they can neither move on the land, nor traverse the regions of air, for they have mere rudiments of wings, and their legs being extremely short, and placed quite close to the tail, causing them to sit up in an erect position; this total helplessness can however only be applied to the Great Auk and one other bird, the Dabchick or Little Grebe, which however can, like the ear-wig, make a shift to fly, under extreme circumstances, and which is very well known to frequent almost every piece of water of any extent. The other Auks can manage to fly a little, and something in the manner of the Coot and Moorhen. There is one kind indeed, the Shearwater, which flies very well, and also runs as well as any of the Gulls; but the others, including the Puffins, are miserable hands at terrestrial movement.

(To be continued.)

ON UNITY OF SYSTEM.

(Continued from page 77.)

THE life of every natural creature proceeds from and returns to one source, the individuality being only temporary, except in man, who is responsible. The spirit of life thus being never separate from its source, and consequently never partial or imperfect, but only apparently modified by the agent which it develops, may be supposed to represent in each creature the law which governs the whole visible world, and, accordingly, that every kind of creature is expressive of the system of all the earth, and that this expression or image is not more complete or perfect in one kind than in another, but that each kind has its peculiar perfection, and that what is developed in one class of creatures is degraded in another, what is hidden in one is manifest in another. This system appears also in combinations as well as in individual creatures; each region in some degree represents the whole earth; the chronological epochs are the counterparts

of the geographical regions; the course of a year is expressive of the extent of the earth, and each day is expressive of the year. All this is effected by the law of divergence, which will be now explained.

It is well known that there is no apparent difference between the kinds of living creatures at the beginning of their existence, and that the great divisions of beings up to man, are successively manifest during the growth, beginning with the distinction between the animal and the vegetable kingdoms, and continuing through the successive divisions of the animal kingdom to that of species. It is obvious that if matter were merely to be raised from its lowest state to its highest degree of organization, man would be the only kind of creature on earth; but this law of development acts by means of divergences, and the way by which the law of divergence is controlled may be termed the law of degradation. In other words all the developments are divergences, and no kind of creature, from the lowest up to man, makes any real progress in its development, or advances at all towards the creatures which are above it in degree, but, on the contrary, diverges from them. And man also, as will appear in the sequel, makes no real progress towards a higher state by the development of his faculties, and by the progress of civilization, and of the arts of life.

Beginning with the mineral kingdom, which is the foundation of all plants, of animals, it is found to have a development which is termed crystallization, and which has a peculiar perfection and exact regularity of structure, exceeding all of the like kind in the vegetable and in the animal kingdoms. This perfection may be termed the divergence of the mineral kingdom, being, so to speak, figurative of, or representing the divergence of each higher degree of creation, and ceasing when the mineral substance is transferred to, and assimilated with vegetation, its crystallized state being wholly unfit for that effect, like as the development or divergence of each living creature precludes its progress to a higher degree, and diminishes its affinity to the kind which it most resembles. It thus appears that if the law of divergence were the only law, there would be no connection between the creatures which are its manifestations or illustrations, except in their common origin, and in their mutual difference not being apparent at the commencement of their existence, but that they would radiate, as it were, from one surface. But the divergences are ordained to be limited, not only in extent, but in number; and each epoch of animals has its peculiar combination of species, and the same species, generally speaking, never occur twice, or in two different epochs, and the creatures of each epoch must mostly or wholly cease before those of a new one are developed. Man alone, (with, in some slight degree, a few creatures who are associated with him,) comprises a succession of epochs,

which, like those of animals, are all different, and the substance of each earlier one is transferred to the succeeding one.

(*To be continued.*)

THE NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

CHAPTER I.—INTRODUCTORY.

AN historical notice, a learned dissertation upon antiquities, or a drier topography, is not that which will be found in the following pages; no, I enter upon an easier and more pleasing task, to myself at least, and trust that it may prove equally so to my readers. The district I am about to describe is not the place of my birth, but of my adoption, for it was to this spot that I was brought when labouring under the sickening influence of the unwholesome vapours of the metropolis; here it was that I drew first an unpolluted breath of the free air of Heaven, to which salubrious change I probably owe my present being: it cannot, therefore, be surprising that I should undertake the task of celebrating its beauties, or that such task should contain for me a certain degree of pleasure. I have entered upon it with the more confidence since I am but an atom of the mass of its admirers, for it may be safely affirmed that no one once visited it for a summer without (if in their power) doing so again.

Having resided on the confines of the parish for upwards of twenty-five years, my knowledge of its general features is consequently considerable; these I shall endeavour to set forth in the clearest light, and as I am neither a scientific naturalist or geologist, I must be understood to speak in popular phraseology, and to state things exactly as they are, without ornament or addition. It is impossible but that in the course of so many seasons, a cloud should have occasionally passed over the prospect, but then, although they must cause particular localities, as we gaze upon them, to revive, melancholy recollections lend a superior interest to the scene, as lively and far deeper than the brightest reminiscences of days gone by, for here gloom is present, there departed and softened, and mellowed by the hand of time.

The admiration of a rural landscape must be the natural bent of the mind, for although the conveniencies of a town life in some measure supplant it, with what double gratification do we return to it and inhale its sweet breath; and whilst we revel in the pleasures of artificial life, as a relaxation from daily toil, pursue that toil merely for the pleasure of retiring into the country in our latter days. Horace has this idea in his first satire, where he says—

“*Ut in otia tuta recedant.*”

It is the general end of all labours carried on in the town, and I question whether you could find one man thus locally employed for his living and profit, who does not look forward to such a reward at the conclusion. Many who can afford it keep both a town and country residence, and amongst us lawyers the saying is almost proverbial, that what we gain in fee legal we lay out in fee simple; and simple enough some of our *bar-gains* are, for want of agricultural knowledge, and no lack of designing venders of the commodity. Still to live an easy country life in one's latter days is a delightful reflection, one to which the mind naturally turns as a solace in time of toil; nor can any one who has enjoyed it rationally, say that it has fallen short of his expectations, for, where there is a thing really to be enjoyed, if we are denied the pleasure, surely we must refer the defect to ourselves. It is here that so many who make it their last sojourn fail; for, mistaking the definition of ease they become totally idle, which two words are as different in their meaning as bodily suffering and fanciful annoyance. Because we are no longer forced to labour for our subsistence, it is surely no reason why we should be inactive, and lead, thenceforward, useless lives, when there are so many things leading to beneficial results, and which are mere pleasurable pastimes. Nay, the greatest possible happiness a man can experience is constant employment, which, without absolute fatigue, never allows listlessness to become his companion. Even a certain degree of actual fatigue is necessary to enjoy life thoroughly, for if we do not induce it we never can know what recreation is.

There are many, who, enjoying all the luxuries of the table, are totally ignorant as to the manner of their production. If they knew the toil, the variety of process, and the distance which procured them, would it not cost a greater interest in the several qualities of each item, and tend to dispel in a great measure the fastidiousness and epicurism which so often prevails; if so, is not the cultivation of the soil a very delightful source of useful pleasure? To trace the seed first deposited in the earth by the hand of the sower, and buried by the harrow which follows on his steps, to see it sprout through its superincumbent earth, and clothe the fields with verdure, until, rising to full growth, it becomes whitened by the scorching beams of the summer's sun, cut by the reaper, borne by the wagon to the barn, the grain separated from the stalk by the thrasher, ground by the miller, and formed into bread by the baker; and all this process is gone through by every morsel of bread we eat. Look next at Horticulture and the rearing of flowers, so charming by its ornament and perfume, and, after this, the study of nature generally; the birds, the animals, the insects, the reptiles, even the inanimate vegetable world spreads out for us a table, a feast of knowledge, in the wilderness;

and even the blue vault of heaven itself displays its silver orbs, purer, brighter in the wild than in the city. There is nothing above or around that will not repay us a thousand times for our attention!

But my readers will say, "what is all this to Sunninghill?" I answer much, for it was this which led me to study its features, and to find an inexhaustible fund of pleasure, which never fadeth amid its sweet scenes. Without this it had possessed little interest for me, and I would lead those, who as yet know not this pleasure, to study their own native regions, and whether they give their thus acquired knowledge to the world or not, not to leave that which they can have "without money and without price" unsought.

(To be continued.)

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 87.)

58. *N. camelina*.—Common.

N.B.—The larva of this insect may always be distinguished from its congeners by the two red tubercles on the eleventh segment. A beautiful rose-coloured variety is not unfrequently found, which an inexperienced collector would at once pronounce to be the larva of a different species. I have however kept these larvæ separate, and there is not the slightest difference in the perfect insect. M. Duponchel remarks that this variety only occurs in the autumn brood. The larva is polyphagous. I have, I think, taken it upon all our British forest trees, except the ash, yew, fir, holly, and the horse and sweet chesnut. In confinement I can most positively assert that it is double-brooded; the perfect insect appearing in May and June, and again in August. Whenever I have kept the eggs found in May, the larvæ have produced the perfect insect in August. My worthy correspondent, Mr. Harding, of Stapleton, states that out of a brood of twenty-five larvæ, hatched this last spring, every single pupa emerged in August. I have not the shadow of a doubt that the same result occurs in a state of nature to all or part of the spring brood, and that the eggs laid by these August moths, produce larvæ full-fed in September, October, and November, which pass the winter in the pupa state. I took but little care of my larvæ, often half-starved them, and kept them in a room

with the windows constantly open, so that confinement was, if anything, calculated to retard rather than accelerate maturity. I have moreover beaten the larva full-fed in July, but being stung I did not rear it. What is still more conclusive, I am again firmly supported in my opinion by M. Duponchel and Guenée, who remark of this larva, "The individuals found in July produce the perfect insect in August. Those found in October pass the winter in the pupa state."—"Les individus qu'on trouve en Juillet deviennent insectes parfaits en Août. Ceux qu'on trouve en Octobre passent l'hiver en chrysalide, et ne donnent leurs papillons qu'en Mai ou Juin de l'année suivante. (C.)

59.—*N. cucullina*.—I have been assured that this insect has been taken in Suffolk, but I did not meet with it.

N.B.—I have much pleasure in adding this insect to the list of Suffolk lepidoptera. I beat two larvæ last August a few miles from this place, and Mr. W. Baker has, during the last few years, taken six or seven of the perfect insect in the same locality. It appears, however, to be very rare. I had also, I believe, the pleasure in the summer of 1853, of re-discovering this insect in Bucks., after its non-occurrence in England for several years. I was casually examining some maple twigs in July, when I found eggs which from their appearance I felt convinced were not those of *N. camolina*, the only other British *Notodont* which feeds on maple. I took about ten of them home into Derbyshire, and reared five larvæ, which when full-fed proved to be indubitable *Cucullina*. My friend Mr. Greene, who was at that time residing in Bucks., ran me very hard in my discovery, for upon writing to inform him of my grand haul, he replied that a few days previous to the arrival of my letter, he had himself beaten the larva. I had beaten two small larvæ the previous year, but not knowing what they were, or what I had beaten them from, I killed them by giving them beech leaves. It appears to feed exclusively on maple, and what is still more remarkable, it prefers the most shady spots, and may generally be found in the greatest plenty where the sun can seldom penetrate. I only once beat two larvæ from a sunny hedge, and they were both of them beautifully suffused with red, like the rose-coloured variety of *N. camolina*. It is very uncertain in its appearance; one season the larvæ are tolerably plentiful, whilst the next scarcely one is to be seen. It may always be distinguished from its congeners, by the glass-green dorsal stripe which extends from the head nearly midway along the back. It is a very easy insect to rear. It spins a cocoon similar to that of *N. camolina* and *dromedarius*, among moss or roots of grass, etc., just at the surface of the soil. It has never, I believe, been found in the pupa state in England. The egg, which is laid in July, and placed on the under side of the leaf, is of a very delicate semi-transparent white, and easily distinguished from those of *N. camolina* and *dromedarius*. The perfect insect appears in June, and the larvæ may be found from August to October, of various sizes. It is only single-brooded. I have reared the larvæ from eggs laid in confinement in May. They spun up the end of June and the beginning of July, but not a single moth appeared till the following May. If my readers wish for further information, I must refer them to my papers on the double-broodedness of some of the *Notodontæ*, at pages 4592, 5148, and 5292, of the "Zoologist"

for 1856. I have twice succeeded in getting this insect to pair in confinement, but it is very seldom that it will do so. I have not been able to visit its favourite locality for the last two years. (C.)

60. *N. carmelita*.—One larva, which however unhappily died. It is curious that, though generally very successful in finding the pupæ of this genus, I never succeeded in meeting with one of this species.

61. *N. Dictæoides*.—Very scarce. A few beaten larvæ from birch, but none bred. It has been asserted that the larva of this species sometimes feeds on poplar, and that of *Dictæa* occasionally on birch. Here I have no hesitation in speaking *positively*. I do not believe that *Dictæa* was *ever* taken off birch, or *Dictæoides* off poplar. It is just possible that they may be *made* to feed on those trees, though I strongly doubt it. It is well known that the larva of *Dictæa* is often of a reddish brown colour, and that it constantly assumes that appearance just before becoming a pupa. Should then the tyro find one of these dark-coloured specimens, he might easily mistake it, as I myself once did, for *Dictæoides*, and say that he had taken it off *poplar*. It is very probable also, that he would not be undeceived even by breeding it, the two species being so very similar in the perfect state. This seems to me a simple and satisfactory explanation of what I have no doubt is an error. It is well deserving of notice, that these two insects generally emerge from the pupa very late at night, or early in the morning, and unless the collector be at hand, they will inevitably spoil themselves, as they begin to fly almost immediately after the wings become strong, and frantically batter themselves against the sides of the cage.

N. B.—The larva of this insect, as far as my experience goes, feeds exclusively upon birch. M. Duponchel mentions alder as a food-plant. This may be the case sometimes, but in Derbyshire, where this larva is in some seasons not very uncommon, and where birch and alder grow freely intermixed, I never beat a single larva off the latter tree. The following description was taken from a full-fed larva in 1856:—"Length, about two inches; back, deep purplish brown, darker in the middle—very glossy. On each side a broad yellow stripe containing the spiracles, which are black with a white marginal ring; on the anal segment a rugose horse-shoe plate. Head, minutely spotted with white, and having two dark parallel lines running down the centre; immediately behind the head a pale bluish transverse bar, succeeded by a black one. Belly, greenish yellow, with a broad purple stripe on either side; anal segment and dorsal protuberance studded with a few scattered hairs. Hubner, Westwood, and Rennie, have figured and described the larvæ of *Dictæa* by mistake for this species. I have taken the larva full fed in July, and again in September and October. The perfect insect I have taken twice, once at rest on the bole of a birch, just emerged from the pupa, at about three o'clock, p.m., May 11th; and the other in July, by placing a light at my bed-room window. It appears to be double-brooded; I have not yet been able to try the experiment, but M. Duponchel remarks:—"It (the larva) is found at the same time as that of *Dictæa*, that is to say in June and September; it perfects its transformation in the same manner."—"Se trouve aux mêmes époques que celle de la *Dictæa*, c'est à dire en Juin et Septembre;

elle se métamorphose aussi de la même manière." The egg is laid at the back of the leaf, and is scarcely distinguishable from that of *Dictæa*. (C.)

62. *N. Ziczac*.—Not common, though I occasionally met with the eggs and larvæ both at Brandeston and Playford, on poplar and willow.

N. B.—M. Duponchel says of this insect, "This species has two broods in the year; the larvæ which we find in June, are the produce of moths bred in April and May, and which have passed the winter in the pupa state; those which appear from September to the end of October, proceed from moths bred at the end of the summer."—"Cette espèce a deux générations par an, les chenilles que l'on trouve en Juin proviennent de papillons éclos en Avril ou en Mai, et qui ont passé l'hiver en chrysalide; celles qui paraissent depuis Septembre jusqu'à la fin d'Octobre, proviennent de papillons éclos dans le courant de l'été." It is also double-brooded in this country, that is, the eggs laid in May produce moths in July or August, and the produce of this second brood become full-fed in the autumn, and pass the winter in the pupa state. This occurs both in confinement and out of doors. I had a brood of *N. ziczac* in May, 1854, from eggs laid by a bred female. They spun up the end of June. About the 18th. of July the first moth appeared, and in a short time every pupa had emerged. I immediately decided *N. ziczac* was double-brooded, but was met by the objection that it was confinement which had caused this rapid maturity. This last spring, 1857, Mr. Gascoyne, of Newark, had about seventy pupæ of *N. ziczac*, these all produced moths in May, and whenever they had a chance they paired. The produce of this brood, which were kept out of doors, and on growing plants, were full-fed and spun up in July. They all produced moths in that month and August. This brood also always paired when allowed to do so, and laid fertile eggs. Mr. E. Shepherd "distinctly denies" that *N. ziczac* is double-brooded. I leave the readers of "The Naturalist" to form their own conclusion. The egg of this insect has a sort of bluish tinge, which distinguishes it from the rest of the *Notodontæ*; it is laid on the under side of the leaf. The larva feeds indiscriminately on the various species of poplar, willow, and willow, and is exceedingly variable in colour. I may add that whenever I have found eggs or larvæ of this insect in June or July, the perfect insect has almost invariably appeared in August. (C.)

(To be continued.)

ARE THE NOTODONTIDÆ DOUBLE-BROODED?

BY THE REV. J. GREENE.

I HAVE read with much interest the remarks of my friend Mr. Crewe, upon the double-broodedness of some of the *Notodontidæ*, and I freely confess that he makes out a strong case. Still his answer to my main, I may say my *only* objection, is not satisfactory. My objection was and is, that of the pupa dug up even as early as the beginning of August, there is no instance on record of the perfect insect appearing from them

in the same year, which circumstance, if true, strongly militates, as it appears to me, against the theory of the insects being double-brooded. The objection applies with greater force to *Camelina* than to *Dictæa*, for I have frequently turned up the former the first week in August, the latter only occasionally; but in neither case has the perfect insect ever appeared before the following spring.

Mr. Crewe suggests two answers to my objection. The cause of my failing even to *force* them, he considers to be obvious; "because they were not the produce of eggs laid in May, but at the end of June or in July, and were not intended to appear till the following spring." Now this appears to me to *assume* the whole point at issue between us. I see no reason whatever why the pupæ found at the beginning of August, should *not* be the produce of eggs laid in May, or at the beginning of June. On the contrary, it seems to me, that they unquestionably *are* the produce of those eggs, and of none other. I confess I do not understand Mr. Crewe's argument here. His eggs laid in May, produced the perfect insect in August. Very well. Those eggs were, of course, *laid* by the parent which had passed the winter in the pupa state. The eggs were laid, and the parent dies. *What then lays those eggs in June and July, the produce of which is not intended to appear till next year?* If my friend Mr. Crewe, can answer this question, it is more than I can. But to state the case a little more particularly. I find a fertile ♀ *Dictæa* at the end of May; she lays her eggs, which hatch about the second week in June; by the end of July, or beginning of August, they are full fed, and go down. I dig up half a dozen pupæ, and try to force them; but they will *not* be forced. And why? Because, according to Mr. Crewe, they were *not* the produce of the eggs laid in May, but of those laid in the end of June and July. I ask again, what laid these latter? *Supposing* this question satisfactorily answered, I would ask, is it possible that an egg of *Dictæa*, laid on the first of July, could hatch, feed up, and turn to a pupa, by the first week in August? I pause for a reply.

As to Mr. Crewe's second answer, namely, M. Duponchel's statement, that the spring brood spin up between two leaves, while the autumnal brood burrow into the earth. I place little or no value upon it, that is, the statement. I appeal with confidence to Mr. Crewe, and to every English entomologist, whether they ever knew such a circumstance to occur, as that of *Dictæa* spinning up between two leaves! But, granting it to have occurred once or twice, it lies with Mr. Crewe, and Messrs. Naish, Harding, and Gascoyne, to assert that it is the *custom* for the spring brood to do so, if they would build anything upon M. Duponchel's statement. That they will *not* assert this, I am confident.

To sum up:—I cannot give my assent to the statement, that either

Camelina or *Dictæa* is naturally double-brooded, until one or more of the pupæ of those species dug up in a normal state, produce the perfect insect the same year. I dig at poplars, oaks, elms, etc., all the year round, but I never found a pupa of either between the first week in June and the last week in July.

Marston Montgomery, Ashbourne, Derbyshire.

Ceropacha flavicornis.—I find there is a great discrepancy in the appearance of the larva of *C. flavicornis*. Stainton, in "Manual," says it is found in September; the Rev. Mr. Greene informs us it is taken in June. Now at what period does the moth appear?—with us in the very early spring. From March 20th. to April 9th., I took fifteen specimens; did not see one after this date. The larva I have not yet taken, but have no doubt that it is full-fed at the end of May and beginning of June. In Scotland, perhaps, the insect comes out later, then the larva will be found late also. If you could give your dates, and all those making district lists give theirs, some approximation to the truth would necessarily ensue, and we should then have correct data to write upon. So again, with the discrepancies of *L. callunæ*. I have bred *L. quercus* very largely both from egg and larvæ found. I have never seen one of its larvæ with blue rings, both the males and females vary as to their shades of colour, at least my specimens do.—C. G. Cox, Fordwych House, Canterbury, March 16th., 1858.

Larvæ of Aegeria Bembiciformis.—In cutting willows, where *Æ. Bembiciformis* abounds, the rods ought to be taken off near the root, the larva, if present, will be on the stem about seven or eight inches up; cut a piece of the wood off, say fourteen inches long, the insect will be almost certain to be found in it; take it home, insert the piece either in damp moss or mould, placed in a box with a gauze cover; the willow will grow, and the perfect insect appear in due time. Should you have the larvæ only, then bore a hole two inches up the centre of a piece of willow large enough for the insect to bury in; the piece ought to be about an inch or an inch and a quarter in diameter; this will grow well in a finger-glass: by adopting this simple plan I rarely fail. Last year I bred a great many, and was delighted to see them take wing. I found they had laid their eggs on some young willow at my door—a grateful return.—Idem.

Larvæ of Sphinx ligustri.—The larva of *S. ligustri* feeds in this neighbourhood principally upon the Laurustinus. I took twenty-five off one small bush, a most unusual thing, as this, as well as all large caterpillars, I believe, are solitary feeders, at least my experience leads me to think so; but the larvæ of *S. ligustri* is found here frequently doing damage to the young hollies; every year I take them off my large holly trees. In the nursery-grounds near me they strip the young shoots bare; my servant recently brought me one in, that he dug up at the foot of a large solitary oak tree, far away from any other, it must therefore have fed upon the oak. (I may

add here that I have on several occasions found the pupæ of *C. vinula* on the stems of oak, concealed in its hard case.) With us it is rare to find the larvæ of *Ligustri* stung with ichneumon, also the larvæ of *S. ocellatus* generally free, but the larvæ of *S. populi* were very much affected, more especially the late brood. Speaking of this brood, with us, the colour is of a deeper shade, and nearly all have beautiful pink spots. A very curious instance of (I believe) ichneumon, occurred with me some time since. I bred a pale specimen of *S. populi*; three weeks after I had killed it the body fell off; it was filled with very small larvæ, but what they were I do not know. A study of the ichneumon tribe, I daily feel is more and more interesting, and I hope this season to commence collecting them. Perhaps you have a species with you that attacks *S. ligustri*; it is certainly a curious fact, although we abound with ichneumons in this neighbourhood, this insect should escape with almost perfect impunity, more especially considering its large size and bright colour.—Idem.

Camptogramma fluviata, Hub., a *Geometra* new to Britain.—One day last September, my brother and I were just leaving Branton Burrows after a tiring and rather unsuccessful day's work, when my brother started a little moth out of some dry rushes, which, after a short chase, he captured. When on the wing we took it merely for a *Scopula ferrugalis*, but on looking at it in the net, I saw it was a small *Geometra*, though what I could not pronounce at the moment. When at home, on examining it again, I took it for one of the smaller species of the genus *Phibalapteryx*, though I was by no means certain to which species positively to refer it. This winter, on arranging my insects, wishing to become certain as to the name of my little capture, I forwarded it to Mr. Stainton, who kindly informed me that it was *Camptogramma fluviata*, of Guenée, a species new to the British Islands. I dare say this account will prove interesting to the entomological readers of "The Naturalist."—MURRAY A. MATHEWS, Raleigh, near Barnstaple, March 15th., 1858.

Guenée's notice of the above insect is as follows:—

"*Camptogramma fluviata*. Hub.—280, 281. Treits, II, p. 55, et Sup., p. 207. Her. Sch., p. 175. Lah. 316. Led. 102. Larvæ unknown.—Hab.—Middle of France, Italy, Sicily, Central Russia in September. Always rare.

Of this little species Hubner appears only to have given a figure of those varieties having an interrupted band. Moreover it appears to me that even the slenderness of this band is accidental, for I do not perceive any other essential difference between this species and the following varieties.

A. Median band paler, continuous, not narrowed, and of middling size; subapical mark simply oblique and not angulated. Hab.—North America.

B. Median band as large as that of *Gemmata* and exactly of the same form. Hab.—Middle of France."

In "The Zoologist" for March, Mr. Doubleday points out the fact that the above insect has been confounded in British collections, with a still rarer moth, *Phibalapteryx gemmata*, Hub. The latter has been taken by Mr. Standish, and Mr. Harding, of Stapleton; Mr. Newcombe, and our correspondent Mr. Mathews, have taken the former during the last summer.

Mr. Doubleday says, "though closely allied, they are readily distinguished; the central black spot in the superior wing of *Fluviata* is destitute of the white iris, and there is a short oblique line at the apex of the wing, which is wanting in *Gemmata*." We hope collectors will look out for these species next summer.—ED.

Lasiocampa quercus var. *callunæ*.—I do not think from all that has been written about our Scotch *L. quercus*, that it can be considered specifically distinct from the English. In a species I look for characters in the perfect state, which shall separate it from every other species. These characters, in *L. callunæ* (so called) I have not been able to see. You can convert Mr. Crewe, however, by assuring him, that in Scotland, "from a batch of eggs laid by a ♀ *L. callunæ*," all the larvæ have blue rings when young, and all of them remain about ten months and a half in the pupa state. Mr. Crewe would like them to lie twelve or thirteen months in their cocoons, but I think he should not insist upon this, and, to be reasonable, should be satisfied with ten months and a half. Perhaps, however, Mr. Crewe's conditions are limited to England. The middle of August is the average time at which they spin their cocoons, the range being from July to the first week in September. The imago may be considered to appear on the 1st. of July, thus giving ten months and a half for the pupa state. This species being in this latitude so strictly biennial,* it follows that imagines of 1857 are not related in blood to their cousins (♀) of 1856. I do not know whether this has been remarked before. In relation to this particular, I have observed that the perfect insects are more abundant every second year: 1855 and 1857 were plentiful years.—A. CHAPMAN, Bothwell Street, Glasgow, March 20th., 1858.

Half-broodedness v. Double-broodedness.—I have had two pupæ of *N. Dromedarius*, and five of *N. Camelina* two winters. They changed to pupæ in September, 1856.—Idem.

M. Guenée's change of names of the Geometrae.—We have received a letter from our friend Mr. Doubleday, in which that gentleman explains that we were in error when we stated that his Catalogue was formed on the basis of Guenée's nomenclature. We have much pleasure in making the following extract from Mr. Doubleday's letter:—"I have just seen 'The Naturalist' for April, and wish to correct a little error into which you have fallen, with regard to my list of insects. Guenée had nothing whatever to do with the arrangement or nomenclature of the *Geometrae*. When I undertook that Catalogue, I had no acquaintance with M. Guenée. * * * I subsequently supplied him with the names attached by Linnæus himself, in the Linnean cabinet to the *Tortrices*. * * * M. Guenée has endeavoured in all his works, to restore the Linnean names where no doubt existed about them, and there can be no pretension for again changing these names." With reference to the species and varieties, Mr. Doubleday remarks,—"I have always thought *Fer-*

* I met with an exception once: one passed two winters as a pupa, thus making its duration of life three years.

ruginea and *Unidentaria* would eventually prove to be one species, and last summer I saw a series from the fens, in which there was every variation of colour, from the bright red to the black band. Mr. Eddleston, who has taken numbers of *O. filigrammaria*, seems positive that the Scotch specimens called *Autumnaria* are identical with it."—ED.

Miscellaneous Notices.

Occurrence of the Parrot Crossbill, (Loxia pityopsittacus,) at Cheltenham.
—The occurrence of this rarely-observed bird deserves notice. The fact was communicated to me by Nathaniel Skelton, an observant naturalist and accomplished bird-preserver, residing at Cheltenham, in a letter, from which I annex the following extract:—"In April last, (1857,) there was a small flock of seven Common Crossbills about this neighbourhood. I found them several times, and killed four. On Sunday, June 7th., I heard a Crossbill calling in an apple tree. I saw it was a very fine red bird, quite alone. I went round to the fir trees in this neighbourhood to look for it five mornings following very early, and at last found it: it was alone as before. I killed it, stuffed it, and put it away, and in the course of two or three months after, I took it out and put it on a table with those killed in April, when I saw it was a larger bird, and on consulting Yarrell's History, it proved to be the 'Parrot Crossbill.'" From this it would seem that the note is very similar to that of the Common Crossbill: on that point Yarrell is silent.—W. V. GUISE, Elmore Court, March 2nd., 1858.

TO THE EDITOR OF "THE NATURALIST."

I write to inform you that I have this day shot a specimen of the Golden Plover in winter plumage in the marshes through which the Test runs in this parish. Not having seen one in this neighbourhood before, and finding no mention of this bird as occurring in Hampshire in your work on "British Birds," or in that of Mr. Yarrell, I think it worth mentioning to you, as I observe notices of such matters in "The Naturalist."—C. T. MAURICE, Michelmersh, Romsey, Hants, March 3rd., 1858.

Oil-Gland of Birds.—I said in the July number, 1857, that I should in a future one, make a remark on Mr. Waterton's "Essays in Natural History," and I now proceed to do so. In the preface to the work he states that he shall exclude all controversial matter, and yet subsequently he gives his comments on my remarks on the Oil-Gland of Birds, and omits all notice of my reply! True, I overturned his arguments, but if he shrunk from exhibiting his defeat, he ought, even in any ordinary case, to have kept back the observations which led to it, but how much more after the pledge to the public he himself had voluntarily given. I am content

to leave such conduct to the judgment of all honourable minds, and rest satisfied with the only inference which can be drawn as to Mr. Waterton's consciousness of his defeat, thus evidenced by his making a show of his side of the question, and carefully suppressing the other.—F. O. MORRIS.

Occurrence of the Fulmar Petrel, (Procellaria glacialis,) in the South.—This rare visitor to the southern parts of our Island was washed ashore here, near Kemp Town, on the 30th. January, 1858. It was picked up by a fisherman, and taken to Mr. H. Pratt, Naturalist, of Duke Street, Brighton, to be preserved and set up. It was found during a very heavy gale from the south-west. It had apparently been dead only a very short time; the eyes were turned black, and it is presumed that from some cause it had become blind, and naturally was starved to death. It is an adult female specimen, and the plumage in fine condition. In dissecting the bird, Mr. Pratt found it had what he calls a double windpipe; it has two distinct tubes inside, and running through the whole length of the windpipe,—a circumstance which neither Yarrell or Macgillivray has noticed, but I think most probably may be found in all the genus *Procellaria*.—T. THORNCROFT, Brighton, February 8th., 1858.

Fulmar Petrel off Brighton.—I have just secured a good specimen of the Fulmar Petrel, which was picked up blind off Brighton by a fisherman. This is the only instance I am aware of this bird having been met with in Sussex.—G. GRANTHAM, Hove, February 5th., 1858.

Birds shot in the Dumfries district.—January 2nd., 1858.—Buff-breasted Merganser, (*Merganser castor*.) 7th.—Bittern, (*Botaurus stellaris*.) 22nd.—Golden-eyed Garrot, (*Clangula chrysophthalma*.) male and female. 28th.—Blue-winged Shovel-bill, (*Rhynchaspis clypeata*.) female. 30th.—Short-eared Owl, (*Strix brachyotos*.) A variety of the Moorhen, (*Gallinula chloropus*.) answering in every description to one described in your "British Birds," (vol. v., page 29,) as being shot at Branford, near Ipswich, Suffolk, December 16th., 1847.—W. G. G., Dumfries, February 8th., 1858.

The Little Grebe, (Podiceps minor.)—Having for some time past a specimen of this bird alive, I have had ample opportunities for observing its habits, which I have not noticed as being particularly noted. I had a very large globe with small fish in it, which the bird was able to go into when it pleased to feed, it being so tame as to dive after the fish before me, which it brought up and swallowed whole. When the bird is at rest I observed that it does not rest with the feet upon the ground as other birds do, but turns them up so as to place them under its wings, which it covers with its side-feathers so as to entirely hide them from sight. It will also rest in the same manner upon the water. I have never observed this bird

to sit erect as it is generally figured. When it walks it is nearly erect, with a waddling gait.—H. REYNOLDS, Thetford, Norfolk.

The Cry of the Rook.—The cry of the Rooks at the different seasons of the year, and on different occasions, can scarcely fail to be noticed even by the most indifferent observer. In "The Naturalist" for November, the Rev. F. O. Morris inquires thus:—"Do not my country readers agree with me that the cawing of the Rooks in September and October has quite a different sound from the note of the same birds in the winter or spring months? Whether it be the fineness of the air, at this the finest season of the year, that causes the effect, or whether the voice of the bird is itself different, certain it is, that to me at least, the effect is that I have just spoken of, and the sound most musical." Mr. Aird, a true poet of nature, in his rural poem of "Frank Sylvan," takes notice of their harvest call thus:—

"Has not the rook a harvest cry? A slight
Percussive breathing through her usual note,
Somewhat analogous to the Irish brogue?
A chuckle? that's too strong; we'll call it, then,
The *halitus* of a spirit crowding through
Her fuller voice, like thanks for God's good corn?
Is this a fancy or is this a fact?"

No doubt many are familiar with the cry of the Rooks during the breeding season, a cry which ever awakens in us pleasant associations of boyish days, when roaming amidst the fresh green woods of early spring, watching with delight the battles between the industrious and pilfering rooks; and again that curious croak or danger-signal given by the sentinel perched on the top of some high tree, to warn his neighbours that are industrious, feeding on the corn-fields below; then we have that clamorous cry which indicates a change in the weather; when, to quote from Mr. Aird,—

"High in the airy firmament, a troop
Of maddest revellers, see them wheeling round;
And oft with sidelong flight slant down the sky
They go; and oft with clanging wings, the one
Depending as if broke, swooping they fall
Near to the ground, then upwards shoot again:
They scream, they mix, they thwart, they eddy round
And round tumultuous, till all Heaven is filled
With a wild storm of birds! By this they show
Prescience of windy blasts."

But the finest cry is that joined in by all the "blackening train!" far up in the "pure ether," as they "thick urge their weary flight, and seek the closing shelter of the grove." This may be called their evening hymn.

The most curious cry of the Rook I ever heard was once while passing through a rookery, at the beginning of the building season. I found a Rook lying at the foot of a tree in a dying state, but without any marks of violence. Taking it up, I put it on a stone wall, and had scarcely left the spot when another descended from a tree, making several sweeps over its head, repeating each time a curious and mournful cry. On returning, half an hour afterwards, I found that the bird was dead.—W. G. G.

An Eagle Shot.—A large Eagle, which has been flying about in the vicinity of Arundel, to the terror of many, was shot on Friday last by Mr. W. Ottley, the head gamekeeper of His Grace the Duke of Norfolk. Since the singular visitor has been in the neighbourhood he has been aimed at by many sportsmen, who have been unsuccessful in bringing him down. We believe His Grace has on more than one occasion had an unsuccessful shot. Being a strong bird, and usually flying very high, it required some considerable force to kill him. On Friday last, however, Mr. Ottley, who was in a plantation in Arundel Park, between Bevis's Grave and the walnut trees, had a good shot, and succeeded in wounding him. The bird struggled considerably, and at length perched on a tree, from which he was soon levelled, and taken to the Castle, where, by direction of His Grace the Duke of Norfolk, he was laid out to be shewn to any one who chose to go and see him. After this the Eagle was sent to Mr. Ledbeater, the ornithologist, of London, to be stuffed. He turns out to be a young male of the White-tailed Sea-Eagle, and not a Golden Eagle, as was supposed. Mr. Ledbeater is also of opinion that it is a bird of the first year. Although the bird is of such a large size, measuring with its wing expanded seven feet five inches, it weighs barely ten pounds. The length from the beak to the tail is three feet, and the breadth across the shoulders one foot. The beak is three inches and a half long, and the centre talon two inches. The quill feather from the pinion joint measures twenty-three inches and a quarter. Its principal haunt was near the South Wood and Houghton chalk-pit, and many mutilated rabbits have been picked up which have been killed by the distinguished visitor since he has been in the neighbourhood.—*West Sussex Gazette.*—From "The Times," Wednesday, Feb. 24th., 1858.

A totally New Idea.—It has occurred to me that some honest man among the entomologists might earn a good livelihood as follows; namely, if he lives in London, where he would have access to the British Museum and its collections. I say then that a great desideratum is, especially among entomologists in the country, and particularly with those who have other

employments, and are not able to give up so much time to their favourite study as they would wish, to have some person—to be depended upon both morally and scientifically—who could name species for them from time to time in the different orders; and if he were to receive a moderate but fair remuneration for the work, say half-a-crown or five shillings for every hundred species, depend upon it it would pay him well, while it would be an immense boon to those who, like myself, cannot as they would turn twelve hours into four-and-twenty or forty-eight. Even if not fully up to the work at first, he would soon become thoroughly “au fait” at it, by dint of examination and comparison at the Museum. “Practice makes perfect.”—F. O. MORRIS, Nunburnholme Rectory, April 2nd., 1858.

The Rev. F. O. Morris would be much obliged to any correspondent who would send him an Obituary Memoir of the late Mr. Richard Weaver. If the late Dr. Shirley Palmer had survived him, he would have done justice to a deserving man, whose merit is attested by the “contumely of the unworthy.”—Nunburnholme Rectory, March 16th., 1858.

Proceedings of Societies.

Thirsk Natural History Society—Botanical Exchange Club.—The monthly meeting of the Thirsk Natural History Society was held on the evening of Wednesday, the 3rd. of March. Mrs. Alban Atwood was duly elected a member of the Botanical Exchange Club. Mr. J. G. Baker read a paper by Mr. C. C. Babington, on the supposed new *Epilobium* from Gormire, and explained that the circumstances under which it grows altogether militate against the idea of its having been produced by hybridisation between *E. obscurum* and *palustre*. Mr. J. H. Davies exhibited specimens of *Cylindrothecium Montagnei* from West Yorkshire, Gloucestershire, Sussex, and Westmoreland; of *Hypnum salebrosum* from Gloucestershire; of *Orthotrichum Hutchinsiae* from Cumberland; and of the true *Bryum turbinatum* from North Yorkshire.

The Retrospect.

THE BEST MODE OF SETTING LEPIDOPTEROUS INSECTS.

“*Utrum horum mavis accipe.*”

THE few observations I thought it necessary and desirable to make, “pro bono publico,” on Mr. Greene’s plan of setting Lepidoptera, will, I hope, be taken in no unkindly mood, nor the following remarks made necessary by his:—

Mr. Greene tells us that the size of the pins used must ever be a matter of taste. This is what I hope I may without offence characterize as a self-evident proposition; but when he had himself pointed out with proper animadversion the ordinary recipe, "Take the largest pin you can find, if with a gigantic head so much the better," etc. I shewed that in my opinion, taught by experience, he was himself recommending, to some extent, the very thing he was reprehending, and properly reprehending, in others.

2nd.—He asks me if I possess such insects as *A. atropos*, *S. ligustri*, and *S. convolvuli*, etc. I answer that I have, and have long had them; that I have four specimens of each of those species in my cabinet, fine ones too, the last-named being all of my own capture, which is perhaps more than many entomologists can say, and two of the *Atropos* of my own rearing, and that each and every one of them is set with a No. 13 pin, larger ones having already been long since and purposely removed from some of the others. I further assert that in "each and every" case of these, No. 13 is not only sufficiently large, but abundantly so for the proper fixing of those insects, both from above and below, and not only so but the appearance of each specimen is greatly improved and advantaged by the adoption of that size. As to my being alone in the preference for it to those he mentions, I can only say that I hope for the sake of the appearance of the cabinets of others, that the contrary is largely the case.

3rd.—Mr. Greene next states in reply to my suggestion that the depth of the boards should have been given, that the figure sufficiently represents it. If so, why, may I ask, did he himself think it necessary to give with the very same figure the depth and breadth of the groove, which the self-same figure might, according to him, have explained without the measurements?

4th.—In answer to my remark that his plan was not a new one, he says that he never said that it was. To which I similarly reply that I never said that he did. He did, however, I think, say something like it in saying that he "ventured to suggest" his mode "after many years trial." But, further than this, I have here to observe, that it was not unnatural for me to expect, as I certainly did expect (which thought perhaps it was that made me express myself as I did) something new, from the observation of my worthy co-editor in the No. for December, 1857, page 272, "On this point we shall, next month, give an admirable paper by the Rev. J. Greene, by studying which every one may insure good setting."

5th.—He points out that he did not exactly say, "move up the wing with the piece of wetted paper," but "hold it down when moved up." So be it. It seems to me at best but a clumsy way of doing business; and as to its being better than pinning the wings (though *pro tempore* only) with a minute pin, I must remark that the latter is not a plan that I

adopt myself once in two thousand times—the rounded wood system makes it unnecessary—but still, if it be used, the hole made by such a pin being invisible unless by means of a microscope,

("Cur in amicorum vitiis tam cernis acutum,
At tibi contra,
Evenit inquirant vitia ut tua rursus et illi.")

I should be inclined to give it the preference over the mode he suggests, which must at least, I should think, be liable to rub the wings, and so injure them, far more than the minute orifice I have spoken of.

6th.—Mr. Greene "emphatically denies" that the effect of the setting by means of the turned woods is better than his mode, or the process so quickly performed. I emphatically re-assert both assertions; and as to the danger of the threads rubbing the wings of some of the more delicate species, I should have supposed that "even a child" entomological would have known that the danger, which otherwise indeed would exist, is altogether and completely prevented by the well-known method ("omnibus notum tonsoribus atque poetis") of placing a piece of silver paper between the thread and the wings. (See the "Aphorismata" in my "History of British Butterflies.")

With regard to the quickness of the mode, I throw down the glove—not that I think that excellence is to be sacrificed to speed.

"Ecce,
Crispinus minimo me provocat: accipe si vis,
Accipiam tabulas; detur nobis locus, hora,
Custodes; videamus uter plus *settere* possit."

I will set a hundred specimens of *Noctuæ* by my mode, and let Mr. Greene the same number by his. Let the setting of each be tested by an umpire, and he shall have my hundred specimens if they are not equally well set as his, and in less time.

I have only to add that I am inclined to think that few collections in England exceed mine in point of setting. I am in fact over-fastidious, and if he wishes, let any fair umpire be named by Mr. Greene, to compare his collection with mine, specimen with specimen, and I will give him every specimen of my own setting in my cabinet that is not so well set as his corresponding one, if he will give me each one of his that is not better set than mine. I will include my foreign collection in the challenge, as I relax and re-set all the specimens, to be compared with any such of his if he collects them.

Mr. Greene does not say how much slant the boards ought to have, as the best form, which would have been as well, instead of leaving it "ad libitum," inasmuch as specimens set by one person so often come into

the cabinet of another. Nor does he say what sort of pins should be used for the braces; yet this is a very important "point," for it will be found that pins strong enough for the purpose are too blunt to go well into the wood, as indeed he shews himself by recommending cork to be put at the bottom of the groove for the pin in the insect, and they therefore are liable to fall out, especially if one is travelling about. The French, more thoughtful, as I saw at Paris, use accordingly needles with heads of beads, made I suppose for the purpose, or of wax. The boards are however best made of cork, and then the common entomological pins can be used.

One advantage of the boards made in the way Mr. Greene shews, is that they may, if desired, easily be cut up into short lengths for using with the cotton thread, which so will be easier made than by turning.

I am not aware that the plan of using the turned woods is at all peculiar to the London Entomologists.

As to the superiority of the rounded over the flat method, though I prefer the appearance of the former, yet I am inclined to believe that in process of time it goes off very much, if not entirely, through the subtle influence of the changes of weather, and the natural elasticity of the wings, even in quite dry situations, safe from damp and mould. The form however is, as I have shewn, by no means the only advantage of the use of the turned boards.

One other remark of Mr. Greene's I must most strongly express my dissent from, namely, his recommendation that the pin should bend slightly forward. I hold on the contrary that it should be all but perfectly straight, and if anything slightly inclining backwards, and for this plain and palpable reason, that whereas the insect would look best without, if it were possible, any pin at all, so the next best thing must be to let it be seen as little as possible, and if it be leaned forward you catch sight of the whole length of the back, so to call it, of it; while if you look down upon it, it is so fore-shortened that you only see the head.

"Since the above was written," as the saying is, I put a copy of Mr. Greene's figure into the hands of the carpenter, and told him to make me a board according to it. He presently asked, entirely of his own accord, "How deep is it to be?" Let Mr. Greene do the same with any other carpenter, previously uninstructed by himself, and let us see whether he will not afford the same practical commentary on what I have said and on what Mr. Greene left unsaid.

I agree with Mr. Bree's recommendation of No. 15. Let the numbers stand thus: Nos. 18, 10, 15, 8, 13.

F. O. MORRIS.

Nunburnholme Rectory, April 5th., 1858.

Harlequin Duck, (*Fuligula histrionica*).—In "The Naturalist," vol. vii., page 163, there is a notice copied from the Davenport Journal, of a female Harlequin Duck shot at Maxstoke Castle, on the 7th. of April, 1857. I have lately made particular inquiries respecting the above, and I am informed, on *undoubted* authority, that the bird which was mistaken for the female of that rare Duck, was in reality a female Scaup Duck, (*Fuligula marila*).—HENRY BUCKLEY, Calthorpe Street, Birmingham, April 3rd., 1858.

The Querist.

[*Feeding Snakes*.—The best way of feeding the Common Snake is to push a piece of bread soaked in milk, or a young mouse, down its throat, with a goose-quill, (not cut at the end,) and then to leave the Snake entirely to itself, in a warm sunshiny place, for four or five days, with a saucer of milk in its box, only approaching it to change the milk. In this way I have always succeeded in getting Snakes to feed freely.—CHARLES ELLIS, Cookham Dean, Maidenhead.

In answer to John Brown's question as to the food of the English Snake, I think he will find that it will eat mice, and some of the smaller birds.—A. H., Spring Hill, Northampton, March 13th., 1858.

Bird-nesting in the Fens of Cambridgeshire and Norfolk.—Can any of the readers of "The Naturalist" inform me when is the best time for a Bird-nesting expedition into the Fens of Cambridgeshire and Norfolk? Also which are the chief spots that should be visited, and on what part of the coast are the principal breeding-stations of the Gulls, Terns, Guillemots, etc., situated?—HENRY BUCKLEY, Calthorpe Street, Birmingham, March 15th., 1858.

[Mr. M. C. Cooke, Trinity Church School, Lambeth, London, is the very person to give the above information; and I have no doubt he will be as willing as he is able to do so.—F. O. MORRIS.]

Melolontha vulgaris.—In "The Naturalist" for January, I saw a query about *Melolontha vulgaris* being found in a perfect state in the winter. I do not think that it is an uncommon circumstance, as I have three or four times found a considerable number collected together, in holes, under the roots of trees in hedges, in January and February; and last year, on one occasion, I found forty-eight in one bunch.—CHARLES ELLIS, Cookham Dean, Maidenhead.

[This seems conclusive.—F. O. MORRIS.]



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BY C. R. BREE, ESQ.

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NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

CHAPTER II.



THERE is not, perhaps, in the whole extent of England to be found a village more widely scattered, or more rich in variety of soil, undulation of surface, or natural beauty, than that which I am about to describe. It lies in the extreme south-eastern corner of the county of Berks, some portions of it being scarcely one mile distant from the great western road, leading from London to Southampton, which divides the counties of Berks and Surrey. It is in longitude 40° west, and in latitude 25° . The junction of Surrey and Buckinghamshire is some seven miles distant, between the towns of Windsor and Staines, which lie to the north-east and east, and to which latter place a corner of the county of Middlesex reaches. The parish of Sunninghill is twenty-four miles west of London, and is bounded on the south and south-east by the parish of Old Windsor, to the west and south-west by Windlesham, and to the north and north-west and east by the parish of Winkfield. A branch road leading to the town of Wokingham or Oakingham, which is nine miles distant, and to Reading, the county town, which is sixteen to the west north-west, runs through the village, and is as good as a main highway, in fact it is such to a certain extent; although now that coaching days and all their glories are departed, it is no longer in the spick-and-span condition which whilom distinguished it. This district originally formed a part of the kingdom of Wessex, and is now in the deanery of Reading. That part which is now the inhabited portion, and where the houses chiefly cluster, may be arranged into three divisions; one of these comprehends an extent of three square miles, lying on the north-western side of the boundary line; another, which is about the centre, is not so extensive; and the last occupies the south-eastern side, very near the corner.

The first of these portions is, properly, the village, the oldest house at present standing being there. This group is irregularly built along the ridge or on the sides of a steep descent, running east and west, and facing to the north, and commanding a very extensive and romantic view of a moorland valley, called Sunninghill bog, from a line of marshes which occupy its base; a steep line of hill arises on the opposite side, on the summit of which the above-mentioned branch road runs; on the further side of which, again, is Ascot Heath, so well known for its sporting celebrity. On the extreme south-west there are extensive plantations of the Scotch pine, and the prospect in that direction is entirely of a heathy character; and here the hand of modern improvement has not been idle, and the once lonely "moor and moss," whose echoes were awoke only by the pee-pee of the

Pipit, or the bleat of the Snipe, now echoes to the wakening shriek of the locomotive, and trembles at its tread.

The second cluster of habitations stands in an exactly contrary position, occupying, as I have said, nearly the centre of the parish. This is placed on the sides and in the bottom of a valley quite divided from the rest, and nearly a mile and a half distant to the north-east, and known by the name of "Cheapside," and abuts upon Windsor Great Park and Virginia Water. In comparison with the first, the country in which this lies, may be termed highly cultivated, as it consists of arable and meadow, intersected with neatly-trimmed hedge-rows, and the odour of peat and turf, which characterizes the inhabited part of the wild district, is seldom met with here; it is altogether of a better style, and many mansions of the gentry, which occupy the rising ground in the neighbourhood, combine to render it the most superior portion. The other which I have mentioned, however, boasts a far more numerous list of the residences of "Les aristocrats," which are here clustered, as it were, extending from the church and parsonage, (which occupy a position between the inhabited parts as nearly central as possible,) and extending in a south-easterly direction on the sides of the road to London, which runs through the village.

The houses here are very irregularly scattered; mansions, mere cottages, and small shops of the place, being mingled in strange but not unpicturesque diversity. This district has had "from time whereof the memory of man runneth not to the contrary," the name of "Beggar's Bush." What was the origin of the appellation does not clearly appear, but it probably arose from camps of gipsies at some distant period, taking up their temporary sojourn within its limits. The character of the ground over the whole village is so very much varied, that it is impossible to describe it minutely, being a constant succession of hill and dale, heath and arable, park and meadow, and these so interspersed as to defy a classification. Intersected, however, as it is by these caprices of Nature, the centre ground is assuredly the highest;—the country falling to a considerable valley on all sides of it, although the quantity of wood that now clothes the great proportion renders this less perceptible to the general observer than it otherwise would be. Upon more minute examination, we shall find that a deep valley runs in an undulating and serpentine manner completely through the parish, beginning at its south-western extremity, and running by the church to the extreme east, where it is lost in the wide low flat of Virginia Water. The uneven nature of the roads more deserves the name of undulations than hills, which are in a very few instances really steep, and many of these have of late years been considerably lowered; but their general character very strongly proves the agency of water in their original formation. The whole surrounding country, to the eye of the most incurious

observer, evidently appearing like a vast basin of many miles in extent, of which this village forms the irregular eastern vent—a sort of outlet for the retreat and settlement of the waters, which in their tumult to escape, threw the mass of the then yielding soil into those commotions and contortions, for which it is at this day so remarkable.

(To be continued.)

MILDNESS OF THE PAST WINTER.

BY THOMAS FULLER, ESQ.

ANOTHER winter has passed into the chronicles of time, and few individuals remember one so remarkable for mildness; in fact the autumn which preceded was unattended with the chilliness so usually experienced at the latter part of that season; verdure was much longer sustained, and trees retained their leaves to a later period than usual. Christmas came without its general attributes, and not until the middle of February did stern winter make its presence known. A biting north-easterly wind, accompanied with severe frosts, then came upon us; snow covered the ground, and the dread season became fully developed.

“Sharp boreas blows, and nature feels decay;
Time conquers all, and we must time obey.”

The duration of this severe weather was brief; in a few weeks a sudden change came on.—

“Through the lurid chambers of the south,
Walked out the joyous Spring.”

My impressions in a ramble through the fields on the 14th. of March, I shall never forget; a complete change had taken place, and the genial warmth of the atmosphere was most grateful to the feelings. Thrushes and other birds, whose singing had been stopped by the late severe weather, had now resumed their songs with some new arrivals, and for the first time this year I beheld the Sky Lark in his aerial flight, and heard with unmixed pleasure his flowing wild notes, as faithful to his task in being the first to proclaim from aloft the coming of the vernal season; then came also for the first time the full note of the Blackbird. Thus are we rapidly approaching the genial Spring.

“Now on the rural kingdom roves
Soft pleasure with his laughing train;
Love warbles in the vocal groves,
And vegetation plants the plain.”

It is grievous to say how much the pleasures of rural excursions are

lessened by the perpetual warfare waged against the feathered tribes. Thrushes and a few other species continued singing all through the late mild winter, although thinned in number by the peripatetic sportsmen, who generally take the field about Christmas, and the few which remained rendered wilder, and nearly scared away; still a few were to be heard enlivening the short days with their cheerful notes until the severe weather in February set in. Then came forth gallant sportsmen, armed with double-barrels, shot-belts, and powder-flasks, traversing the fields, and peering into hedges, bringing down many a pretty songster.

Now and then during the short time snow remained on the ground, a glossy sable Blackbird, with golden beak, or a brown Thrush, with beautiful speckled breast, would appear on my lawn, and gradually approach the house with cautious series of hops, in expectation of food; but immediately your attention was caught and interest awakened, forth crept a cat from beneath the shelter of the nearest evergreen shrub, and scared your welcome visitor away. I have banished these detested cats from my house, but there is no means of ejecting them from my gardens, as they are fostered in the houses adjoining, and all gardens are alike subject to their depredations; no walls or fences have power to exclude them. With a view of keeping them clear of my premises, I have lately procured a rough Scotch terrier, of the Dandy Dinmont breed, and have trained him to as great an enmity to cats as Hannibal had to the Romans. The very sight of a cat from a window throws my *Pepper* into fits, and his excitement becomes quite amusing, until he is free to rush after the intruder; but his scampering and noise makes the remedy nearly as bad as the disease, added to which my friend *Pepper* has in his nature something of the character given by Edie Ochiltre to the worthy and eccentric Laird of Monekburn,—“His bark is wawr than his bite;” and this the cunning felines have discovered in this wise:—A few days back, Master Pepper was too quick for one of them, (a wily she —,) long my abhorrence; she turned upon him with open mouth, glaring eyes, and projected claws, ready for defence or assault. My less ferocious and good-tempered assistant drew back, and consequently lost his mission for terror. His bark now is daily less heeded.

I am pretty well arrived to the conclusion, that all attempts to study Natural History in the neighbourhood of a populous city such as this, amounts to the pursuit of knowledge under difficulties nearly insurmountable. The only chance of gratification in so agreeable and health-inspiring a recreation is in rural and retired districts. To such a spot I shall henceforward aspire.

Bath, March 20th., 1858.

ON THE APPEARANCE OF THE CUCKOO.

BY THOMAS FULLER, ESQ.

I AM very much inclined to question the truth of the statement, which has appeared in some of the north-country papers, to the effect that the notes of the Cuckoo were heard in a field near the village of Cleadon, in the county of Durham, on the 11th. of February last, as communicated by your correspondent, Mr. Barrington Cooke. That the weather was extremely mild for the season at that time is true, and it is a very common thing for trout to rise during this month, but the appearance of the Cuckoo in February is indeed a rarity; whether such an uncommon event is more likely to occur in the northern, than in the southern parts of England, I am not prepared to say. We have numerous sheltered valleys in this country, but I do not think the oldest individual living remembers such an instance.

A few years ago I was deceived myself. It was on a fine day in the early part of March, in a walk towards the village of Southstoke, about three miles from this city; the notes of the Cuckoo, as I then thought, came distinctly upon my ear, and returning home with such conviction, noted the circumstance down in my diary; but upon passing through the village afterwards, and speaking to a farmer on the subject, he laughed, and told me that a boy belonging to the village imitated the note of the Cuckoo so nearly as to deceive anybody not aware of the fact. Now had it so happened that I had left this neighbourhood in the interim, I certainly should have remained under the delusion of having heard the Cuckoo in the early part of March, and published it as truth.

As for the boys, mischievous as they are everywhere, they appear to be pre-eminently so here; there is no limit to the versatility of their pranks, and their number most certainly is far beyond proportion to the community, according to my observations in other places. One of the rascals attempted a hoax upon me this very morning. In my early walk before breakfast, going through a field, a rosy fellow, carrying milk into the city, met me, putting down his milk-pan, and sitting upon it,—“Don’t ò hear the Cuckoo?” said he. Being quite unprepared for so interesting a question, I was for the moment deceived, and was just upon giving the best attention, when a wicked twinkle in the rogue’s eye, brought to my recollection that it was the first of April; so raising my stick, and flourishing it over his shoulders, I thought to frighten him, but the urchin saw in my countenance nothing to alarm him; one of his companions came up at the moment, and pointing to my feet, ejaculated “Why the gentleman’s shoe is untied!” I was again taken off my guard, and looked down at my understandings, the

nimble jesters were out of the reach of my stick in an instant, in hearty laughter calling out, "Oh you April fool!"

The Wryneck, which always precedes the Cuckoo, I heard the first time this year on the 24th. of March. This bird is called by the country-people here, "the *Pea-bird*," or "the *Cuckoo's Mate*." The weather is extremely cold to-day, a north-easterly wind is prevailing, with every appearance of a severe frost to-night. Now whilst I am writing, a Jackdaw has pitched upon the wall of my garden, only a few yards from the window. My wife declares it to be a Rook, and the size of the bird (rendered larger in appearance by its close proximity) warrants the supposition, but his grey pole leaves no doubt of his species. He is a fine specimen, truly; well, I had no idea before that he had such a bull-shaped neck.

Back, Pepper. Be quiet, this is no case of cat, (whenever my eyes are directed towards the garden, the dog's attention instantly follows, holding himself ready for active service in event of feline intrusion.) What is it the Jackdaw is watching so intently upon the ground? Perhaps a bone or piece of meat has been left there by Pepper. He is off. No doubt his sharp eye has detected an enemy somewhere. Yes, there is a cat under that Portugal laurel; verily it is the same ferocious —— noticed in my last communication. Now Pepper, after her my boy; let me open the door—there he goes like an arrow—the creature turns at bay. Pepper is as brave as a lion, but he is not savage; at a word of encouragement from me he would, according to the sporting phrase, *go in*. But we will have no fighting and scratching. Come away Pepper, before thy sharp teeth can have penetrated thy antagonist's furry skin, her terrible hooked claws would tear out thy bright intelligent eyes; so come away, I say, my stick shall effect an ejection from my premises, which is all neighbourly feelings allows. But this communication is already longer than intended.

Bath, the first of April, 1858.

[Mr. Fuller's new enemies, the boys, reminded me of his old ones, the cats, before I came to his mention of them. I fear the Somersetshire boys are behind our Yorkshire ones in manners. Much is to be attributed to the schoolmaster. There was no school at my previous parish of Naferton till I had two built there, and in like manner none here till I got one built, the effect on the "civilization" of the children being in each case most marked and striking.—F. O. M.]

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 111.)

63. *N. trepida*.—Tolerably plentiful. As far as my experience goes, there are only two methods, which present a reasonable prospect of success, of obtaining this insect, namely, by breeding from the egg, or by digging for the pupa. The beautiful larva is such a conspicuous object, that it frequently becomes a prey to hungry birds, and is at the same time so subject to the attacks of ichneumons, that I do not think one in five escapes both these enemies. While on the subject of pupa-digging I may mention one great advantage of it, namely, the large size of some of the specimens obtained in this way. It will readily be admitted on all hands that insects bred in confinement rarely, if ever, attain the size they sometimes reach when left to their own devices. This may easily be accounted for. It is almost impossible, (in a town quite impossible,) to keep them constantly supplied with fresh juicy food—there must always be a comparative absence of pure air, and lastly, there is in many cases a want of what I consider very necessary, sufficient moisture. I am quite satisfied that in a state of nature larvæ drink: I do not say this in an offensive sense—I only insinuate that they drink *water*. That they do so in captivity is beyond all question. Sprinkle a few drops of water occasionally in your breeding-cage, and watch a caterpillar the moment its mouth touches a drop. If of moderate size and tolerably thirsty, he will not leave it till the whole is imbibed. This I have noticed over and over again, and consequently I always dash a little water over their food, about once every two days. I had nearly forgotten to remark that the larva of this species is one of those which I have observed to be subject to what is called muscardine, a name, given I suspect, to cloak our ignorance. What is muscardine? The larvæ, which feeds, I think, exclusively on oak, attains a large size, and before entering the earth assumes a much darker appearance. There is, I believe, no question as to its being only single-brooded.

[N.B.—The larva of this insect is taken sparingly in this neighbourhood. I have never found the pupa by digging. I bred it, in my study, in 1857, between March 29th. and May 13th. “Muscardine” is probably a corruption of “Muerdines”—the small Hyphomyrtons Fungi which form moulds and mildews. (B.)

I have several times dug up the pupa under oak, but have never taken either the larva or the perfect insect since my residence in Suffolk. I have

beaten the larva into a sheet and umbrella in Kent and Herts., from the 1st. to the middle of July; they varied from half-fed to full-grown. In 1856 I took two perfect insects when staying in Hampshire, with my friend Mr. Hawker, a ♂ May 6th., and a ♀ May 8th. Mr. H. took a crippled ♂ April 29th. They were all resting on the trunks of oak. My ♀ laid a number of eggs on the evening of her capture: they hatched May 26th., and were full-fed July 12th. The pupæ (kept in the house) began to emerge March 29th., 1857, and continued doing so till May 1st. Four couples of moths paired in the cage; the females laid a great number of eggs. The first batch laid April 23rd., began to hatch May 11th., and the others took about the same time. I was most unfortunate with them—out of each lot more than half perished when on the point of hatching. Those larvæ which came out never appeared healthy, and gradually one after another sickened and died: I only succeeded in obtaining one pupa from the whole lot. I sent a great many eggs away to various friends, but they were nearly all as unlucky as myself: I am quite at a loss to account for the reason. When full-fed and ready to bury, the larvæ assume a dirty purplish hue. It is, in my opinion, one of the most beautiful of our British larvæ. I have seen both *P. nubeculosa* and *E. versicolora* full-fed, but do not think them fit to rival *trepida*. The egg resembles that of *P. palpina*, but is of course larger. I know of no moth which is so dwarfed by being reared in confinement. (C.)

64. *N. chaonia*.—Scarce. This insect seems to be rare everywhere. I have only once met with the larva: it is much larger than that of *dodonæa*, glossy, fat, whitish green, with a row of yellow spots on each side above the legs, and two yellow lines down the back. It resembles a good deal that of *dictæa*. Mr. Stainton, in the "Manual," gives July as the time for finding it. I should say this was too late, as I took the specimen alluded to above, quite full-fed, in fact it went down the same day, the second week in June. I have occasionally dug up the pupa mixed with that of *dodonæa* in the proportion of about one in thirty, but it goes down much earlier. It (the pupa) is somewhat shorter, stouter, and more glossy than that of *dodonæa*. I once had a pair couple; the female laid a great number of eggs all over the breeding-cage, but I was unfortunately from home, and they all perished. The egg is large, and if I remember rightly, pure white. The male is a furious and distracted flier, and speedily spoils itself. As far as my experience goes, the larva feeds exclusively on oak, and, like nearly all the species in this genus, the parent seems to prefer detached trees, whereon to lay her eggs.

N.B.—I had two specimens last year from larvæ found on oak, the first appeared April 21st., ♀ the second ♂ May 16th. I found a single larva on oak, full-fed, June 7th., 1857. I bred a ♀ this year, April 27th. (B.)

I have beaten two or three of this larva every summer since 1852. I never, with one exception, saw it before the 1st. of July, nor after the 15th., but have taken it of all sizes between these two periods. The exception I allude to is mentioned by Mr. Bree; he and I beat a full-grown larva last summer, June 7th. Till nearly half-fed this larva and that of *N. dodonæa* closely resemble one another. Both have the yellow dorsal stripes, and

indeed are so much alike, that it is difficult to distinguish them. When, however, they have moulted for the last time, the merest tyro cannot confound them, as there is little or no similarity. *Chaonia* moreover, is generally at least three weeks earlier in its appearance than its congener, and they are not likely very often to be beaten together. When full-fed the yellow dorsal stripes become almost invisible. I have bred the perfect insect five times from the larvæ, May 14th. and 16th., 1853, and April 8th., 17th., and 21st., 1856. The pupa were kept in the house. It is a delicate insect to rear in the larva state. I have once or twice killed it by giving it the young sucker leaves of the oak; cholera soon ensued, and death speedily followed. I have found as a rule that larvæ should never be fed upon the rank sucker leaves of the tree upon which they feed. It invariably disagrees with them.

65. *N. dodonæa*.—Very plentiful in the pupa state. The larva, which is very subject to the attacks of a large black ichneumon, is full-fed about the end of July. Those which are occasionally found in August rarely produce the perfect insect, being almost invariably stung. The imago varies much in the intensity of colouring, according to locality. The first specimens I ever found were taken in Gloucestershire, and were much darker and more richly coloured than those taken subsequently in Suffolk. Indeed all the insects taken in the former county excelled in depth and richness of colouring. This was noticeable in the pretty *O. coryli*, where the dull grey ground colour usually seen in that insect was replaced by a creamy yellow. Two of these specimens were exhibited at a meeting of the Entomological Society. The male of *dodonæa* is a strong and active flier. The larva feeds, I think, exclusively on oak.

N.B.—I take both larvæ and pupæ but sparingly of this insect. (B)

I have but rarely beaten the larvæ of this insect, and when I have it has invariably been stung. The pupa is far from uncommon in Suffolk under oak, but local. In this neighbourhood it is decidedly rare. It is fond of getting into the little ledges and nooks at the foot of the stem, where is only just enough soil or moss to cover it. "The early bird gets the first worm," and if the collector does not go and look for the pupæ at the end of September and the beginning of October, he will find that he has generally been forestalled by mice, titmice, nuthatches, and other insect-hunters. The larvæ when full-fed may always be distinguished by the bright orange-red stripe on the side. The larvæ of the three last-named species feed exclusively on oak, and there is, I believe, no question that they are only single-brooded. (C.)

66. *D. ceruleocephala*.—Extremely abundant in the larva state. I presume the eggs are laid in autumn, and pass the winter in that state, as I have never met with the hibernating larva. I have been told that they are cannibals, but I have not noticed it myself, though I have had as many as forty in one cage. Possibly they may devour other caterpillars, but I have not exposed them to the temptation. They have powerful jaws, and the cage must be covered with something stronger than gauze, as they are very restless, and soon eat through it. I have never once seen the insect on the wing. The pupa may sometimes be found in August and September, under loose bark on old hawthorns, crab-apples, etc.

N.B.—If I were to decide from my own experience, I should at once say that the larvæ of this insect were not cannibals. When a boy I have crammed them by shoals into a small and almost air-tight box, like slaves in the hold of a ship, and subjected them to treatment of the most aggravating description, but never in one single instance remember to have seen them bite or devour each other. My friend Mr. H. Evans, has told me that he has seen the perfect insect in some abundance around the gas-lamps in September and October. The larva very frequently feeds upon the young leaves of the common laurel in spring, and apparently rather likes prussic acid than otherwise. (C.)

67. *P. bucephala*.—Common of course. I noticed this insect for the first time in the perfect state last year. I saw several specimens hanging suspended from the under side of leaves, with the wings folded completely round the body, like a little roll of cloth.

N.B.—I have not unfrequently seen this insect sitting on a blade of grass just after it had emerged from the pupa. Though one of the commonest it is one of the loveliest of our British Lepidoptera. (C.)

68. *C. curtula*.—Not very uncommon in the neighbourhood of Brandeston, but much rarer at Playford. Having mentioned the habits, so far as I am acquainted with them, of this insect in the larva and pupa states, in my paper on pupa-digging, I need not recapitulate them here. I observe, however, in the "Manual," that the larva is said to be taken in the months 6, 7, 8, and 9; from which I infer that it is asserted to be double-brooded. This assertion, I suppose, rests upon the authority of M. Duponchel, from whom the description of the larva is taken. Mr. Stainton, after giving May as the time of its appearance in the perfect state, properly puts a note of interrogation for the period of the *second* appearance, as if in doubt. I fully share his doubt. I have never met with the larvæ earlier than the second half of September, and from that on to the end of October. The imago has always appeared in May. I scarcely think there are two broods, but I speak with diffidence.

N.B.—I am certainly inclined to think that this insect is double-brooded, but cannot speak from personal experience. Mr. Sealy, however, tells us, "Intelligencer," No. 44, page 41, 1857, that on July 2nd. he took in Wicken Fen a full-fed larva, which spun up the next day, and produced the perfect insect July 20th. M. Duponchel and Guénée remark that like *C. anastomosis* the larva is found in June and July, and again in August and September, and that the former *all* produce moths in July, whilst of the latter some emerge in September and October, and others remain in the pupa state till the following May. I have myself never taken the larva except in the autumn. I have beaten it both in Suffolk and Kent from September 4th. to November 4th., both from aspen and black Italian poplar: the moths all emerged from March 17th. to April 19th. The larva is stouter and of a much redder colour than that of *C. reclusa*. The following description taken from a full-fed specimen, may be interesting to some of the readers of "The Naturalist."—Length about one inch; pinkish drab, yellower on the back. Down the centre of the back three interrupted black lines; ditto on each side; the two

outermost dorsal, and the side lines studded at regular intervals with yellow wart-like spots on the fourth segment and last but one a black protuberance. The whole body covered with irregular black spots, and thinly clothed with white hairs. Head black, with two orange central lines. When young it has a broad black band on each side, and a transverse dorsal one by each protuberance. I have taken this larva and that of *C. reclusa*, feeding together upon the same bush in autumn. (C.)

69. *C. reclusa*.—Not uncommon at Brandeston, in company with the preceding; not seen at all at Playford. It seems to prefer willow, but will also feed on poplar. When young, and feeding on the same tree, it is difficult to distinguish from *curtula*. I believe it is sometimes double-brooded, though I have not observed it myself.

N.B.—I have taken this insect in the larva state plentifully both in Kent and Hants., but have not, as yet, met with it in this neighbourhood. Mr. W. Baker has taken it at Ringshall, four miles from here. I am most decidedly of opinion that it is double-brooded. On the 23rd. of June, 1855, I found a small brood of larvæ in Kent, nearly all full-fed: they spun up, and *all* produced the perfect insect during the month of July, in about ten days after turning to pupæ. June 24th., 1856, I took about forty larvæ in Hants., of all sizes; these *all* produced moths between July 14th. and 28th. My friend Mr. Hawker, with whom I was staying, took an equal number of larvæ, and met with a precisely similar result. The females laid plenty of eggs, but they were unfortunately not impregnated. I have taken the larvæ as late as November 4th. I only once found it upon *sallow*; it prefers *aspen*. (C.)

(To be continued.)

Notodontinæ Double-brooded.—The summing up of Mr. Greene's letter on the *Notodontinæ* in the last number of "The Naturalist" is rather extraordinary. He says, "I cannot give my assent to the statement that either *Camelina* or *Dictæa* is naturally double-brooded until one or more of the pupæ of these species, dug up in a normal state, produces the perfect insect the same year. I dig at poplars, oaks, elms, etc., all the year round, but I never found a pupa of either between the first week in June and the last week in July." This is making a bold assertion, in denying the truth of the double-broodedness of the *Notodontinæ*, because he has not met with the pupa during the months of June and July. I suppose that Mr. Greene does not mean to deny that the imago has been taken in the first week of August; I myself have captured them again and again in the beginning of that month, just emerged from the pupæ in fine condition. How does Mr. Greene account for the insect being on the wing in August, if he denies its existence in the pupa state in the months of June and July? Surely the pupa might have been dug up if the collector had known where to have looked for it. Neither Mr. Harding nor myself dispute the fact that some of the pupæ lie over till the spring, but if this circumstance proves them single-brooded, what would Mr. Greene call *Lanestris* that sometimes lays by for

three or four years? If the argument holds good in one case, it certainly must in the other. Although our having bred and taken *N. dictæa* in May and August has been repeatedly stated, I may as well briefly allude to my experience during last season:—May 23rd., *Dictæa* eggs laid. June 1st., eggs hatched. July 25th., imago, (*all* the brood came out.) August 3rd., eggs laid. August 9th., eggs hatched. This brood, I am sorry to say, met with an accident, or doubtless I should now had them emerging from the pupæ. I have taken it on the wing in the beginning of May, and again in *equal numbers*, and in as fine condition, early in August. What further proof is required I am at a loss to know.—ARTHUR NAISH; Brooklyn Lodge, Ashley Hill, Bristol.

Early Appearance of Sphinx ligustri.—In the afternoon of April 28th., I was much surprised to see in my pupa box, a fine specimen of *Sphinx ligustri*, which had just emerged from the pupa. Is not this very early, considering I had only had it in my box a week or ten days, which was placed in a cool apartment. The perfect insect is rarely seen on the wing in this neighbourhood, although the larvæ are extremely abundant.—A. H., Spring Hill, Northampton.

[Should our correspondent favour us with any other communications, we should feel obliged if he will append his name, as it is against our rule to insert matters of fact unless the statement is authenticated by the name of the writer.—ED.]

Uncertainty in the Appearance of Insects.—On March 14th., 1855, I took, at Acton, a beautiful specimen of *Phragmatobia urticæ*. Whilst pupa-digging next day at Battersea, in the new park which was then forming, I found a splendid *Notodonta dictæa* just drying its wings. You would not give the middle of March for the appearance of *P. urticæ* and *N. dictæa*. I have had *N. dromedarius* and *ziczac* coming out at long intervals. It is therefore only by collecting numerous facts that we can generalize.—C. T. COX, Fordwich House, March 15th., 1858.

Notodonta ziczac Double-brooded.—That *N. ziczac* is double-brooded I have not the *slightest doubt*, in my own mind I have quite settled the question. I had some eggs of *Ziczac* sent me last May; the following are the dates of their appearance in the larvæ state:—May 21st., eggs hatched; June 30th., all larvæ buried; July 23rd., first moth emerged. I continued breeding till August 3rd., when the last moth made its appearance; not one remained in pupa. From a pair of these insects I obtained fertile eggs, which hatched August 15th. They duly fed up, and are now in pupæ. I hope to see the perfect insects next May. I may as well remark that I found two larvæ full-fed July 13th. The moths both appeared at the beginning of August. I think this is proof enough that it is double-brooded.—G. F. MATHEWS, Raleigh House, near Barnstaple, February 11th., 1858.

The Notodontæ are Double-brooded.—I think I can easily reply to my friend Mr. Greene's criticisms in the May number of "The Naturalist." At page 84 of the number for April, he remarks that he has bred *N. camelina* from pupæ dug up the previous autumn, from the middle of May to the

end of August. I have no doubt he has. I have myself bred *N. camelina*, *dictæa*, *dictæoides*, and *dromedarius*, from May to July, from autumnal pupæ. Now what I mean to say is this: the moths which appear in May are the parents of another brood of moths in August. The moths which appear in June are the parents of those pupæ which Mr. Greene digs up in August, and which he has tried to force, but without success. Some of these latter are also doubtless the offspring of the dilatory pupæ of the previous autumn, which cannot make up their minds to emerge till August. Mr. Greene seems to think it impossible for an egg of a *Notodonta* to hatch, feed up, and spin in a month's time. All I can say is this; on May 23rd., 1854, I had a batch of eggs of *N. ziczac* and *cucullina* hatching; on June 23rd., the larvæ began to spin up. I certainly never have myself seen the larva of *N. dictæa* spin up between leaves, and all those which I have had full-fed in July invariably buried. I have not unfrequently, however, had the larvæ of *camelina* and *ziczac* from a cocoon between leaves.—H. HARPUR CREWE, Stowmarket, May 8th., 1858.

Nomenclature.—I have some thoughts of beginning an entirely new collection, and in any case it would, I think, be a great boon to many if you would tell us briefly, as at present nomenclature is at such sixes and sevens, since Curtis's and Stephens's Catalogues, from what sources, in all the orders, cabinets may best be named. The same also as to the foreign insects.—X.

[Our correspondent will find most of the families in entomology well arranged in the lists of the British Museum. *Hymenoptera*, by Smith; *Diptera*, *Homoptera*, and *Nemoptera*, by Walker; *Hemiptera*, by Dallas; *Anopleura*, by Denny; *Coleoptera*, by White, J. Smith, and Walton. The best arrangement of the *Lepidoptera* is that of Guenée. Mr. Doubleday has in the press a second edition of his Synonymic list of British Lepidoptera, arranged after Guenée. Mr. Stainton's list of the British *Tineina* is the best yet published. There is a very good Catalogue of European *Coleoptera* called the "Stettin Catalogue," which Mr. Stainton will send for seven stamps. Neither Curtis nor Stevens will do in the present day for naming cabinets. Collectors must not be too impatient; these are works requiring immense labour and great knowledge, and are not very remunerative. Some of the British Museum Catalogues are exceedingly well done, such as Smith's British *Hymenoptera*, Walton's *Curculionidæ*, etc. They are printed on one side for labels, as well as in small treatises. Messrs. Dawson and Hamlet Clark have commenced a Catalogue of British *Coleoptera*, but they have only as yet published the *Geodephaga*.—ED.]

Hypercriticism.—Bad orthography is a great blemish in a work claiming a scientific character. On pages 35 and 36 of "The Naturalist," the words *Menthastri* and *lubricipeda*, are spelt wrongly no less than eight times. To stay the progress of error, it would be well to correct these errors as early as possible.—THOMAS CHAPMAN, Glasgow, May 6th., 1858.

[Nothing in our opinion is so trifling as to see men claiming to belong to a scientific community, wasting their energies in finding fault with other peoples' p's and q's. There is no doubt that Fabricius spelt the names as

indicated by Mr. Chapman, but if he will look into Doubleday's List, and Stainton's Manual, he will find in one *Menthrastris*, and in the other *Lubriepeda*; showing at all events, that our contributor has erred, if such a trifle can be designated error, in company with modern entomological authorities.—ED.]

Lasiocampa callunæ.—In taking up the last number of "The Naturalist," I find that Mr. Chapman states *Callunæ* to be a variety of *Quercus*, and am very sorry he has not given us some proof of this. He only states that the larva when young is quite different, but he wishes to see a distinction of character in the perfect state. This he states he has never been able to do. From this I should conclude that he must have examined all specimens of *Quercus* or *Callunæ*, for the difference is very great. First, both males and females are larger, and of a different colour. The spot on the wing of the female of *Callunæ* is larger, and the band on the male is broader and runs up the nerves of the wings, quite different from *Quercus*. A description was given some years back in the "Zoologist," by the late Richard Weaver; he wrote to me when in Scotland last season, to notice this species, and to make some observations on them, to prove whether they were a species or not. I did so, and recorded my notes in the "Zoologist" two or three months back; but such is the uncertainty of human life that these observations poor Weaver never saw. That *Callunæ* is not a Scotch variety, is proved by the species having been captured in England in several different places, but always in low wet places, as in Scotland. I wish Mr. Chapman, or some other northern entomologist, would be so kind as to send me up a virgin female of *Callunæ*, to see if I could attract any males of *Quercus*. I failed in this once, but should like to try again.—H. J. HARDING, 1, York Street, Church Street, Shoreditch.

Capture of Deilephila livornica near Exeter.—The capture of *Deilephila livornica* not being of common occurrence, particularly in the month of April, it may be worth recording that on the 20th. instant, a male specimen of this insect was taken at rest on the ground, in a garden near my house, and is at present on my setting-board.—H. DORVILLE, Alphington, near Exeter, April 22nd., 1858.

The First Fly of the Season.—As I drove to Louth on Wednesday last, in the parish of Elkington, I saw a beautiful specimen of *G. rhamni*, (Brimstone Butterfly,) a male, though snow was still remaining in many places in the woods.—R. P. ALINGTON, Swinhope, March 19th., 1858.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 65.)

Phascogale murina, Waterh. Schinz.	Phascogale albipes, Waterh. Schinz.
Phascogale minima, Temm. Cuv. Schinz.	Phascogale apicalis, Gray. Schinz.
Dasyurus minimus, Geoff. Schreb.	Phascogale leucopus, Gray. Schinz.
Desm. Fisch.	

DIDELPHIS.

- Didelphis virginiana*, Shaw. *Desm. Tem.*
Cuv. Fr. Cuv. Fisch. Schinz. D.
marsupialis, Schreb.
Didelphis Azaræ, Temm. *Desm. Cuv.*
Fisch. Schinz.
Didelphis californica, Bennet. *Schinz.*
Didelphis breviceps, Bennet. *Schinz.*
Didelphis pruinosa, Wag. *Schinz.*
Didelphis cancrivora, Linn. *Gmel.*
Desm. Fisch. Schinz. D. marsupi-
alis, Linn. *Schreb. Temm. Cuv.*
Didelphis aurita, Schinz.
Didelphis albiventris, Lund. *Schinz.*
Didelphis Quica, Natt. *Temm. Fisch.*
Schinz.
Didelphis myosurus, Temm. *Schinz.*
D. nudicaudata, Geoff. *Desm. Cuv.*
Didelphis Opossum, Linn. *Desm. Tem.*
Schreb. Fisch. Schinz. Sarigue
Opossum, Buff.
Didelphis Philander, Linn. *Schreb.*
Temm. Desm. Schinz. D. Cayopolin,
Cuv.
Didelphis elegans, Schinz.
Didelphis incana, Lund. *Schinz.*
Didelphis Derbiana, Waterh. *Schinz.*
Didelphis pœcilonotus, Natt. *Schinz.*
Didelphis dichrurus, Natt. *Schinz.*
Didelphis ochropus, Natt. *Schinz.*
Didelphis macrotarsus, Natt. *Schinz.*
Didelphis microtarsus, Natt. *Schinz.*
Didelphis velutina, Natt. *Schinz.*
Didelphis unistriata, Natt. *Schinz.*
Didelphis affinis, Natt. *Schinz.*
Didelphis domestica, Natt. *Schinz.*
Didelphis crassicaudata, Schinz.
Didelphis lanigera, Desm. *Wag. Schinz.*
Didelphis cinerea, Tem. *Desm. Schinz.*
Didelphis dorsigera, Linn. *Schreb.*
Temm. Fisch. Wag. Schinz.
Didelphis murina, Linn. *Desm. Temm.*
Schreb. Cuv. Wag. Fisch. Schinz.
Didelphis grisea, Desm. *Schinz.*
Didelphis tricolor, Geoff. *Schinz. D.*
macroura, Pallas.

- Didelphis brachyura*, Schreb. *Temm.*
Desm. Fisch. Schinz.
Didelphis pusilla, Desm. *Wag. Schinz.*
Didelphis tristriata, Kuhl. *Schreb.*
Schinz. D. trilineata, Lund.

CHIRONECTES.

- Chironectes variegatus*, Schinz. *C.*
Yapok, Desm. *Didelphis palmata*,
Geoff. Griff. Fisch.

FAMILIA II.—ENTOMOPHAGA.

MYRMECOBIUS.

- Myrmecobius fasciatus*, Water. *Schinz.*

TARSIPES.

- Tarsipes rostratus*, Guer. *Schinz.*

PERAMELES.

- Perameles nasutus*, Geoff. *Desm. Cuv.*
Fr. Cuv. Griff. Schreb. Schinz.
Perameles obesulus, Geoff. *Desm. Less.*
Schinz. Didelphis obesula, Shaw.
Perameles doreyanus, Schinz.
Perameles Gunnii, Gray. *Schinz.*
Perameles lagotis, Reid. *Water. Schinz.*
Perameles Tuckeri, Gray. *Schinz.*
Perameles myosurus, Wag. *Schinz.*
Perameles macrourus, Gould. *Schinz.*
Perameles Harveyi, Waterh. *Schinz.*
Perameles Lawsonii, Less. *Schinz.*

CHÆROPUS.

- Chæropus castanotis*, Gray. *Schinz.*
Perameles ecaudatus, Ogilby.

FAMILIA III.—PHYTOPHAGA.

PHALANGISTA.

- Phalangista ursina*, Temm. *Less. Cuv.*
Schinz.
Phalangista chrysorrhos, Temm. *Cuv.*
Fr. Cuv. Fisch. Schinz.
Phalangista maculata, Temm. *Schinz.*
Cuscus maculatus, Less.
Phalangista macroura, Schinz. *Cuscus*
macrourus, Less.

Phalangista cavifrons, Temm. Fisch.	Phalangista vulpina, Desm. Temm. F.
Wag. Schreb. Schinz. P. rufa, F.	Cuv. Griff. Schinz. Didelphis vul-
Cuv. Desm. P. alba et rufa, Geoff.	pina et lemurina, Shaw.

(To be continued.)

Miscellaneous Notices.

Tortoises.—About two years ago Mr. Cooch, of Cromer, had a Tortoise given him, which he thinks had not been long in this country. Having been placed in his garden, it was found to have scratched a hole in one of the borders, and laid three eggs. Also a Tortoise in this garden laid one egg, and died the following winter.—The VEN. ARCHDEACON GLOVER, in a letter to Mr. Bree.

Peregrine Falcon.—On reading the "Anecdote of a Sparrow," at page 66 of "The Naturalist" for the present month, it occurred to me that the following somewhat similar suspension of the power of flight in a more noble bird, might be worth inserting among your Miscellaneous Notices. Some winters ago, two labourers brought me a very fine live specimen, I believe of the *Falco peregrinus* of Linnæus, which they had picked up in a field about two miles east of this town. It was in excellent condition for stuffing, perfectly clean, and without the least appearance of having been shot. I could not at first believe that a bird looking as that did was unable to fly; but, on raising it up, and letting it go to try, it fell to the ground on its breast, without being able to use its wings in the least, not even to break its fall. I put it in a box, with the intention of sending it to a friend of mine at the Ashmolean Museum, to get it stuffed for me in Oxford, but as I was covering the box over, my daughter, who was watching the bird, gave him a piece of raw meat. This he eat very quickly from her hand, which induced me to take him out again, hoping that I might be able to keep him alive. I placed him in my kitchen, where he was well fed, and at liberty to walk about, but the bird did not seem inclined to do so for some days. He afterwards began to jump on the spars of the chairs, but still seemed unable to use his wings, although not a feather was injured. In about three weeks he could manage to get on the backs of the chairs. From this step in advance he got to the top of one of the doors when it stood open, where he was very fond of perching for a long time together, but was so perfectly tame that he would always allow himself to be lifted down. This quiet disposition, so unlike others of the same family which I had kept before, made him quite a pet. To mount on the top of

this door was the greatest effort at flight which he attempted to make during his sojourn at my dwelling. One fine afternoon, however, while he was quietly perching there as usual, and about five weeks after I had taken him in, he made a sudden dash at the window, knocked out two squares of glass, flew to the roof of a house on the opposite side of the street, sat on it, meditating, for a few minutes, then rose over the tops of some high elms, and after making three or four fine circles in the air, took a straight course northwards; and, although I immediately sent after him, and offered a reward for his apprehension, I never saw or heard of him again from that day forward.—C. FAULKNER, Deddington, March 6th., 1858.

Common Crossbill.—Last week five specimens of the Common Crossbill, (*Loxia curvirostra.*) were killed near the small town of Reeth, in this neighbourhood, by a farmer named Martin. These birds, forming part of a small flock, consisted of four males and a female.—HENRY SMURTHWAITE, Richmond, March 18th., 1858.

Early Occurrence of the Hobby, (*Falco subbuteo.*)—This little Peregrine in miniature, was brought to me, alive, on the 11th. of March, by a bird-catcher, who had taken it in his lark net. This handsome little Falcon is scarce in this neighbourhood; its habitat seems to be more among woods. The same day another bird-catcher brought me two of the Common Kestrel, which had darted at his decoy-birds, but, as in many other instances, the biter got bit.—T. THORNCROFT, Brighton, 15th. March, 1858.

A Vulpo-canine.—In the No. of "The Naturalist" for April, is an interesting account of a Canine Fox, which so nearly resembles an animal in my possession, that I send the following particulars:—A bitch whelp was sent me early last year by a gentleman in Kent, who stated that her mother was a cross between the Fox and the Dog. The whelp is now grown up, and about the size of a Fox, with the head and ears, and much of the appearance of that animal, but with the tail, though bushy, somewhat shorter. It is white, with large patches of greyish brown over the head and back; the coat smooth and hard, and not so full as that of a Fox; the ears sharp and erect, and the muzzle fine and pointed, with the forehead broad, and the head altogether very handsome. Its manners are exceedingly suspicious and shy, so that it will never play even with me, though I have been always accustomed to feed it, and it will dart into its kennel on the appearance of a stranger. For a long time I could not get it to follow me, as it would run back the moment it saw a person, and now it runs to and fro to avoid every one it meets, and generally attracts notice. One day it was much frightened by a number of persons in the

road, and started off at full speed, crossing a brook and several fields, and it was some time before I could catch it, or rather coax it to follow me back, as it will not let me touch it, but shifts away when I make the attempt, and I can only catch it in close quarters. It barks in a shrill, high tone, and appears very fierce when approached by a stranger in a yard in which it cannot get away, and is remarkably active and agile. The sire is a white terrier, and my Vulpo-canine produced two whelps, also by a white terrier, in January, one of which is living, of a white colour with foxy brown marks about the head. It is less shy than the mother, but seems much alarmed, running in a crouching or trailing attitude, at the barking of dogs. Its appearance too is very vulpine.—J. H. HEWER, Reading, April 20th., 1858.

Eggs of the Nuthatch.—In the April number of "The Naturalist," among the miscellaneous notices, a reference is made to an article of mine in the number of December last, on the Nuthatch, wherein I stated that the eggs were "like the Wryneck's, white." I beg at once to acknowledge this as an unpardonable and unaccountable error, and how I could have committed it I cannot conceive. There is no bird, perhaps, with which I am more familiar. The eggs vary a good deal, but are always more or less blotched with a brownish colour.—O. S. ROUND, April, 1858.

The Redstart.—On the 9th. inst., a male Redstart was shot at Caldý Island, Pembrokeshire, on the grass-plot in front of the proprietor's residence. As this is the first known instance of its occurring there, the fact may perhaps be considered worthy of being recorded. The Redstart is rare in Wales, but especially so in the western part of the Principality. It was formerly considered not to visit Wales. Yarrell says, "This bird also visits Wales now, and has been obtained once in Ireland, near Belfast." The proprietor of Caldý Island, who shot the specimen in question, had never seen the bird before, although he had lived in Wales upwards of half a century.—E. K. B., April 12th., 1858.

The Black Redstart, etc.—On the 25th. of last month, I had the good fortune to shoot a Black Redstart, in full summer plumage and excellent feather. Although I know it is contrary to the generally received opinion, I am inclined to think that it had but recently arrived here, as I found it in company with a small flight of Wheatears, the first I had seen for the year, all of which I know had but lately come over. I have seen many Chiff Chaffs, but have as yet not heard a sound of their song. I saw a Hooded Crow here a day or two since—a very rare occurrence in this neighbourhood. He appeared to be much buffeted by his black-coated brothers, into whose company he had thrust himself.—STEPHEN CLOGG, Looe, April 5th., 1858.

Occurrence of Fulco peregrinus and Picus major near Fakenham.—A Great Spotted Woodpecker was shot at Raynham on the 4th. of March; and on the 23rd. of the same month a young male Peregrine Falcon was killed near the same place.—T. SOUTHWELL, Hempton, Fakenham, April 13th., 1858.

Proceedings of Societies.

Thirsk Natural History Society.—The monthly meeting of this Society was held on the evening of Wednesday, the 6th. of April. Mr. A. G. More, of Bembridge, was duly elected a member of the Botanical Exchange Club. Mr. J. G. Baker announced that the list of desiderated flowering plants and ferns for 1858, was in a forward state of preparation, and exhibited specimens of *Ranunculus dronetii* and *Arctium pubens*, gathered by Mr. Kirk, in Warwickshire. Mr. J. H. Davies exhibited specimens of several rare mosses from new stations.

East Kent Natural History Society.—We have been favoured with a report of the inaugural meeting of the East Kent Natural History Society, containing a most excellent address from Captain Cox. We regret exceedingly that we cannot give this *in extenso* to our readers, but, as it would occupy a couple of numbers of "The Naturalist," we must content ourselves with making extracts from time to time. It is seldom we have met with an address on Natural History at once so interesting and practically useful. The meeting seems to have been attended by all the principal inhabitants of Canterbury and its neighbourhood, the chair being taken by Major Munn, one of the Vice Presidents. A great number of specimens in Natural History were exhibited. The following are Captain Cox's opening remarks:—

"The aim of this Society is, to increase the love of Natural History, and diffuse its ennobling tastes through channels hitherto closed by prejudice, indifference, and ignorance; to collect and disseminate valuable information; to appoint throughout East Kent, local contributors, who will be requested to keep accurate notes of all points of interest bearing on the subject, and from time to time report them, as occasion may offer; to have stated meetings, at which papers will be read, and excursions carried out; and finally, to unite in one society, all those admirers of the beauties of Creation, whose kindred souls may there meet and become known to each other for their mutual improvement.

We will now inquire, first, into the advantages of the Society; and then, its objects.

The love of Natural History has, within the last few years, taken such rapid strides, that societies are being constantly formed; and the present is only a type of what is being carried out in other counties.

Formerly, the lovers of Natural History had many difficulties to contend with; their position was isolated, the postal communications imperfect and expensive, and the literature on this subject was very defective. Therefore, comparatively unknown to each other, the labourers in this delightful study pursued their researches under circumstances very different to those which the present extended state of knowledge presents to its votaries. Many kept diaries and notes, but having so little inducement to bring them before the public, doubtless, valuable papers have been lost to science; and many hearts, once ardent in the pursuit of some branch of Natural History, have carried to the grave their glowing enthusiasm, unheard of, and unknown.

But when a society is formed, *it* at once becomes the focus of individual enterprise. Members meet, friends join, and the hitherto solitary student is thus drawn from the seclusion of his study, to the position which his intellectual merit claims; and his collected knowledge is diffused through its transactions, and received into the scientific world, to be registered according to its deserts.

Another great advantage is collecting together objects of Natural History, so that, not only can the student have access to the archives, but also to preserved specimens.

A third, and most useful advantage, is the influence a body of scientific men must have upon their fellow-men. Their equals in education and family position, are gradually, by sympathy, led step by step into the pursuit, and, when once their tastes are indulged, there is little fear their hearts will again be mute to the whispering voice of nature.

But over our humbler fellow-creatures the influence is much stronger; they are invited to join, and to become associates, free of all expense. The natural feeling of pride, inherent in every bosom, awakens new sympathies—new sensations; first from an idle curiosity gazing on the various specimens collected together, his observations soon give a bias to his tastes and feelings, and his mind once enlisted, he seeks out the channel wherein to indulge his new pursuit. But before proceeding further, we must be thoroughly understood in thus strongly expressing the views of the society, that it by no means desires that the taste for Natural History should set on one side those moral duties and obligations which every member of our large community—however humble he may be—owes to society at large; but that it should be a constant source of the highest recreation, and also the means of filling up many a vacant hour, now devoted by the prosperous classes—may I say it?—to frivolous and puerile

occupation, or the still more effeminating influence of ennui; and by the humbler to the beer-shop, the gin-palace, and but too often, I fear, to other haunts of infamy and vice.

The educated class may seek recreation in reading; but the poor neglected artisan, how is he to spend the three or four hours left from labour, previous to retiring to rest?

The answer is but too readily found in the large increase of places of low resort and public amusement; and in their deteriorating precincts, what accumulation of evil threatens his moral and physical condition. But the spirit of inquiry is now on foot, and a brighter promise looms, I hope in the distance.

But to return to our subject. Among the divisions into which Natural History is divided, there are three which more especially are accessible to all—ornithology, entomology, and botany—the study of birds, the study of insects, and the study of plants. There is a rich vein opened at once, a banquet to which all are invited, a feast of which all may partake—satiating never—enduring ever.

Whilst in London a short time since, a friend asked me to take a ramble with him into the neighbourhood of Spitalfields, to see some of the collections made by the poor weavers. Gladly availing myself of his invitation, we started, and were soon traversing the narrow streets that lead to the humble dwellings of this poor, industrious, and hard-working class. Of several collectors, I will only mention one family as a type of the whole.

This family consisted of father, two sons, and a daughter. Their business at the loom was the weaving of white satin. On entering their little parlour, we found it quite neat, though crowded with objects of Natural History. The daughter followed the study of botany; the sons entomology; the father both. On Saturday afternoons, and especially by day-break on Sunday morning, this happy quartett would leave their home, and wend their way into the country, carrying provisions for the day's consumption. Here they would pass the hours, interrupted only by Divine Service, at which they always attended, inhaling the pure and invigorating air, whilst collecting their various treasures. Generally well-laden with various specimens of their studies, they returned home at night, with improved health and spirits, and with minds well content to fulfil the duties allotted to them.

During the week, after work, their evenings were employed in arranging their various collections; and amongst many which they showed us, I was particularly pleased with a book of dried plants, arranged and collected by the daughter, which in neatness might rival those of any wealthy collector. Comment upon such a family would be superfluous; they were honest, in-

dustrious, hard-working people. And that which you have just heard respecting Spitalfields, is also true as regards Manchester, Birmingham, and many other large manufacturing towns. These exhausting dens of human sinew are now lifting the veil that so blindly doomed the poor factory child to a life worse than slavery. The leading men begin to appreciate that more gain is to be extracted from healthy life, than from diseased and waning strength.

Sanitary and salutary laws have been passed by the legislature; and even now, with almost over-taxed exertion, many, directly after factory hours, avail themselves of the charms of entomology to pass their few leisure hours. And it is a remarkable circumstance that some of our most practical entomologists are to be found among this class.

With such deeply interesting facts before us, is it not a commendable zeal, to endeavour to win from low and dissolute pleasures, minds, capable when taught by their persevering energy, to be the instructors of others."

(To be continued.)

The Retrospect.

The Great Snipe, (*Scolopax major*).—The Great or Solitary Snipe is not so great a rarity in this neighbourhood as Mr. Round seems to infer. I know of at least a dozen specimens that have been shot in this neighbourhood. I have one in my collection.—The VEN. ARCHDEACON GLOVER, in a letter to Mr. Brce.

The Querist.

The difference in sound of the cawing of Rooks.—The Editor of "The Naturalist" has inquired of his country friends,—“Whether they do not agree with him, that the sound of the cawing of the Rook, in September and October, has quite a different sound from the notes of the same birds in the winter and spring months?” I quite agree with him in this opinion, and my own observations during the September and October of the last year, the winter which has followed, and the spring, now so happily begun, confirms in my mind the truth of the proposition. During the former period the Rooks were in great numbers over the fields, and the exceeding fineness of the weather was a great inducement to visit them, which I was in the habit of doing almost daily. The Rooks were to be seen feeding upon the earthworms, etc., of which at that season there is a plentiful supply; in close companionship with them were Jackdaws and Starlings. It was curious to watch the motions of the various species; although feeding

together in perfect harmony, their movements were strikingly peculiar to each. The Jackdaws, indifferent to feeding, were strutting about, and appeared to feel gratified with being in the society of their more dignified companions; the Starlings were restless, and continually starting off in flocks.

Whilst the proceedings of the Rooks seemed to be regulated with order and system, their cawings were significant of a good understanding, and the musical tones mentioned by the Editor of "The Naturalist," no one could fail to distinguish.

The Rooks are now busily employed in repairing their old and building new nests; and having a great disposition to rob each other of materials for the purpose, rather than fetch them from a distance, fierce disputes arise, hence the harsh angry sounds and jarring notes, so different from the mellow tones of the same birds in September and October. Who can be so indifferent to the pleasures attending the study of Natural History, as to pass a Rookery at this busy season, without pausing to watch the exciting scene going on, and observing with interest the indefatigable industry and perseverance of these useful birds. They appear to go off in detachments for the purpose of feeding, as few are now to be seen at one time in the fields: the meadows where cattle are pasturing seem to be the most frequented. The droppings of the cattle, which would otherwise remain undisturbed, generating larvæ and insects destructive to vegetation, are all turned over, and every thing injurious extracted; all other manures deposited on the ground undergo the same scrutiny. While thus employed they are remarkably silent; perhaps their powers for cawing have been somewhat over-exerted in their building disputes, and are now reserved, to be used with greater effect upon returning to the works. It is evident no time is lost in feeding, when moving from one spot to another. They fly as near as possible to the ground, for better discovering what might be below the herbage, and their keen sight enables them to detect grubs, etc., even if buried in the ground. As already observed, no cawings are heard, they are pursuing one object and need no converse; they will speedily return to the Rookery, and take the places of another detachment, who, in their turn, will fly off to the fields in search of nutriment.

There are numerous Rookeries in this neighbourhood, one of which appears to me to possess some distinguishing features, inasmuch as the Rooks do not gather in one, or a few large congregations, as I have observed to be their habits at other Rookeries, but in this instance divide into smaller colonies, and build upon the numerous lofty trees in various parts of the domain. This assemblage of Rookeries in view of the mansion has a pleasing effect, particularly when seen from the upper windows, which, aided by the elevated situation of the house, affords excellent opportunity for examining the nests of the birds, and observing their movements; an advantage the

kind hospitality of the owner has enabled me to enjoy. Upon my last visit, a few days back, he told me the Rooks were unusually late this year in commencing their building operations; a circumstance easily accounted for, by the severity of the weather at the beginning of this month. He also informed me that these birds in pairing, display marked affection and constancy; and if by mischance or otherwise one of a couple should be destroyed, the survivor does not seek another mate, but remains in single blessedness. The readers of "The Naturalist" will form their own opinion upon the truth of this statement. I only repeat what my friend has said, and he has excellent opportunities and leisure for investigation.

It is not intended in this communication to enter upon a history of Rooks, or a description of their manifold services to agriculture; these subjects have been fully and extensively treated by learned and competent writers. And the usefulness of these birds at all seasons of the year are so generally known and appreciated, as to render the attempt intrusive, and from an individual so unlearned as myself, simply a piece of vanity. I have therefore only noticed the particular acts of usefulness which came under my own observations in connection with, and illustrative of, the matter in reply to the query of "The Naturalist."—THOMAS FULLER, Weston Road, Bath, March 25th., 1858.

I should be glad if any of the readers of "The Naturalist" could inform me whether there is any book published on the subject of trapping and snaring wild animals and vermin, with instructions in the art.—B.

A cockney reader would also be glad to know the best modes of distinguishing the old from the young in the choosing of game and poultry.—Idem.

Will some of the fen correspondents of "The Naturalist" kindly furnish a list of the species of trees dug up in the fens of Lincoln, Hants, and Cambridge?—W. WALDO COOPER, West Rasen Rectory, March 6th., 1858.

Exchange.



THE undersigned has duplicates of the Eggs of the following Birds, and would be glad to exchange:—Sedge Warbler, Blackcap, Garden Warbler, Whitethroat, Lesser Whitethroat, Wood Wren, Willow Wren, Great Titmouse, Long-tailed Titmouse, Grey Wagtail, Meadow Pipit, Skylark, Wood Lark, Black-headed Bunting, Jackdaw, Sand Martin, Wren, Swallow, Pheasant, Sparrow Hawk, (would like to change for those of the Kestrel,) Spotted Flycatcher, Redstart, Corn-crake, Water-hen, Partridge, and Peewit.—FRANK NICHOLSON, Bowdon, May 5th., 1858.

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THE ENTOMOLOGICAL DEPARTMENT

BY C. R. BREE, ESQ.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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ENTOMOLOGY.

Communications have been received by C. R. BREE, from The Rev. J. GREENE;—REV. H. H. CREWE;—MR. UNWIN;—MR. SIMPSON.

The papers on the Lepidoptera of Suffolk will be continued in the August number of "The Naturalist." We are glad to find they give such general satisfaction.

Misprints in the June Number.—We have to apologize for one or two misprints in the last number of "The Naturalist." We take upon ourselves the entire responsibility of these mistakes, which arise, for the most part, from the non-acquired knowledge of our compositors with some peculiarities of our hand-writing. Thus we introduced in the proof of last number a short note suggesting that *Muscadine* might be a corruption of "*Mucedines*, the hyphomycetous fungi which form moulds and mildews." It will be noticed that the compositor in each word mistook *ee* for *er*, and hence the mistake. We hope to avoid any errors of this kind in future. With regard to the origin of *Muscadine*, we find that it is not a corruption at all, but the French word which expresses the Latin noun *Muscadina*, which is the name of a fatal disease in silk-worms, produced, or rather favoured in its growth, like the mould *Mucedines*, by moist weather.—ED.

ERRATA IN THE JUNE NUMBER.—Page 131, fourth line from bottom, for *Mucedines* read *Mucedines*; for *Hyphomycetons* read *Hyphomycetous*. Page 134, twelfth line from bottom, for *larva* read *larvæ*. Page 135, second line from top, place a semicolon after *spots*. Page 137, twenty-third line from bottom, for *Nemoptera* read *Neuroptera*; twentieth line from bottom, for *Synonymic* read *Synonymie*. Page 138, second line from top, for *Lubricpeda* read *Lubricipeda*.

* * All communications on Entomology intended for insertion in this department of "The Naturalist," must be sent before the 15th. of the month to C. R. BREE, Esq., Stowmarket, Suffolk.

NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

(Continued from page 127.)

CHAPTER III.

HAVING thus given a general description of the disposition and character of the inhabited portion of this district, it is next necessary to consider the various kinds of soil of which it is composed. The predominant feature of the superficies is not, it must be admitted, very productive, being in general a light sand, in some parts a mere drift sand, composed precisely of the same particles as that found on the sea-shore, or in the digging of wells when water is found; and this, more abundantly still, proves the submersion of the whole surrounding country at some distant period. Where this soil has been trenched, or deeply dug, and the rain has again washed it, crystals, in some instances as big as small peas, are brought to the surface; these are white and clear, extremely hard, and when polished and cut, set well, and pass off as ornaments much better than paste, being, in fact, so hard, that the true diamond dust is used by lapidaries to cut them. These are provincially called "Bagshot diamonds," from their being found on the heath which extends to and around the small town of Bagshot, in Surrey, three miles distant to the south-west. I have in my possession a ring made of these stones, which have been taken, by good judges, for rose diamonds.

A very few years back the whole of this country, as far as the eye could reach, was one sterile region of heath and furze, mingled occasionally with a patch or strip of sedge or rushes, whether the soil either inclined to clay or marsh: one dreary region of moorland unintersected by a single road, save the sheepwalks of a few flocks that roamed at will over its expanse; or sprinkled by a single tree, save here and there a thorn or whin bush, those indigenous tenants of the waste, that stand for centuries in their gnarled and stunted hardihood, unaffected by the tempests of heaven or the weight of years, which bow down and mingle with the dust so many much mightier works of nature. Surely the whin, or wild-thorn is the hardiest and longest-lived thing upon the face of the earth; there are many which I could now point out, that have not grown or changed from shoots even into bushes for twenty years! They were anciently looked upon with a mysterious awe, and thought to be the peculiar resort of evil spirits.

"With blanching lip, and cheek with terror pale,
The startled peasant trembles at the tale.
Now at chill midnight, by the moon's pale glance,
Unearthly forms prolong the viewless dance;
And in each wandering breeze that murmurs by,
His busy fancy hears the hollow sigh."—T. S. SALMON.



Thus there was a very old tree of this kind, that stood on the hill about a mile to the west of Ascot Heath, and known as the "hag-thorn." The hill was purchased about the year 1820-21 by a captain of horse-guards, who laid it out in farm and pleasure-grounds, and built a genteel residence near the spot. The old tree was for some time suffered to form part of the garden hedge, but was afterwards cut off near the ground. The old stump was, however, not so easily killed, for it soon afterwards sprouted, and a very considerable bush, grown from the remnant, was to be seen a very few years ago, if it does not still remain, and in the county map, drawn from a survey taken soon after, the spot will be found thus designated. The place where this thorn grew forms the western side of the vast basin, which, as I have said, this part of the county presents. The ridge runs from this to another point, called Tower-hill, from the remains of a building to be seen some years since, and said to have been erected by Henry the Eighth when Swinley Chase, which is about half a mile from it, was used as a royal hunting-lodge. This is not improbable, as the hill itself commands a most extensive prospect in every direction, looking into the counties of Surrey, Sussex, Hants., Bucks., Wilts., and Middlesex, and as the lodge which stood at Swinley, was in the occupation of a Royal Forester, until it was pulled down about the year 1825. The summit of this eminence is covered with a group of (I think) five thorn trees, which are resorted to at Christmas times, for the purpose of gathering mistletoe, which grows abundantly on their rugged trunks. Time has done its work since the time that I first remember this locality, and instead of the free views of brown or purple heather, upon which the eye could then wander freely, you now look upon a sea of green firs, which run for miles on three sides, and indeed clothe the sides of Tower-hill itself, so that, whereas it was a point to be seen for miles, you cannot now distinguish it from the rest of the green ridge. Courts Leat were holden at Swinley, of the manor of East Hampstead, and many curious documents existed among the ancient rolls, not the least of which was a tradition of "Herne the Hunter," whose oak, or that which is said to be, is well known to stand in the little park at Windsor, on the lower side of the castle. This story was put into rhyme by my grandfather, Mr. Stephen Round, of New Windsor, then steward of the manor, and consequently having free access to these old records, I therefore shall insert this without further preface, except to take notice of a discrepancy in point of date. In Shakspeare's "Merry Wives," written somewhere about the end of the sixteenth century, the legend of Herne is thus spoken of:—

Mrs. Page.—"There is an old tale goes, that Herne the hunter,
Sometime a keeper here in Windsor Forest,
Doth all the winter time, at still midnight,

Walk round about an oak with great ragged horns;
 And there he blasts the tree, and takes the cattle,
 And makes milch kine yield blood; and shakes a chain
 In a most hideous and dreadful manner.
 You have heard of such a spirit, and well you know,
 The superstitious, idle-headed, ,
 Received, and did deliver to our age,
 This tale of Herne the hunter, for a truth."

Now this was purported to be spoken in the time of Henry the Fourth, and was written by a person who probably well knew that the legend was as old as that at all events; but in the ballad which follows, it will be seen that Henry the Eighth is the king spoken of. Whether this is a real anachronism, or a mistake in the number of the king, I do not know, but give the ballad as in the original.

HERNE, THE MIGHTY HUNTER.

A FOREST BALLAD OF THE SIXTEENTH CENTURY.

HARRY the Eighth, a noble prince,
 Sat on the English throne,
 And had a pleasant hunting-seat,
 By name of Swinley, knowu.

Near Tower-hill the mausion stood,
 With lofty oaks around;
 Within the park, the chase, and wood,
 The noble deer abound.

Venison was what the king preferred,
 Oft sent his warrants down,
 To kill the fattest of the herd,
 And send them up to town.

To disobey the royal will
 Was little less than treason,
 His stern command they must fulfil,
 Through all the summer season.

At Swinley dwelt a yeoman bold,
 Will Herne, the mighty hunter,
 In scarlet clad, and laced with gold:
 In speech no man was blunter.

No lord or duke dared cheer a hound,
 For fear of him in red;
 But to the king, unto the ground
 Herne bent his haughty head.

He'd shot a stag, for miles and miles
 Where hounds in vain had sought,
 And never stopped for gates or styles,
 Or e'er of danger thought.

Full sixteen hands his courser stood,
 No better in the field;
 And as to speed, and bone, and blood,
 To none would ever yield.

To church or chapel he ne'er went,
 Would rather curse than pray;
 Nor flesh refused in holy Lent,
 Nor kept the sabbath-day.

King's warrants came on Sunday morn,
 Six bucks to take and slay;
 Herne took his horse, his gun, and horn,
 And hasted far away.

Then took his stand beneath a thorn,
 And blew a mighty blast;
 Swift at the sound of his shrill horn
 Six keepers galloped fast.

All dressed in green, and mounted well,
 With rifles at their side;
 "Why sound your horn, we pray thee tell?"
 Each keeper loudly cried.

"I sound the horn," he roughly said,
 "That you might present be,
 And of the herd to shoot six head,
 Under the greenwood tree."

The keepers, in reply, demurred,
 Because 't was Sabbath-day,
 And that the work might be deferred
 They earnestly did pray.

Herne then into a passion flew,
 And swore he'd represent
 The treason of the dastard crew,
 Unless with him they went.

Religious faith to fear gave way;
 In vain the bells did chime,
 And chiming loud, did seem to say—
 "To church, 't is now the time!"

Under the brow of King's Beech Hill
 An herd of bucks did lair;
 The sun was high, the wind was still,
 The weather warm and fair.

From Broomhall's convent came a priest,
 And down the hill did ride;
 His age was threescore years at least,
 A mule he did bestride.

With tonsured head, his beads, and hood,
 To church his course he bent;
 To pray and preach with precepts good,
 Was this sage man's intent.

The huntsman and his men in green,
 The priest astonished spies,
 A sight he ne'er before had seen,
 And scarce believed his eyes.

"Vain men," he cried, "can ye profane
 This day for rest assigned,
 For holy church shew such disdain,
 And disrespectful mind?"

"Think what will be your future fate,
 When ye resign your breath:
 Repentance then will come too late
 To ease the pangs of death."

"Now to and fro the devil prowls,
 And hears each passing bell,
 And hunting for such graceless souls,
 To burn in flames of hell."

"Oh, father," cried the huntsman Herne,
 "Your duty now pursue,
 And then permit us in our turn,
 To yield obedience too."

"To you I shall no further say,
 I fear no monkish spell;
 My master's warrants I'll obey
 In spite of priest or knell."

They parley thus, the deer stand still,
 And listening seem'd to be,
 To learn the haughty hunter's will,
 And wait their destiny.

Scarce had these words escaped his mouth,
 When one came bounding by;
 His haunches fat, of largest growth,
 His antlers broad and high.

As thus the deer affrighted ran,
 Herne aimed his gun—in vain!
 For merely flashing in the pan,
 'T was aimed and fired again.

The gun, so foul and clogged with rust,
 Neglected long had lain;
 With loud report the barrel burst,
 And pierced the yeoman's brain.

Thus Herne the mighty hunter died,
 Contemning laws divine;
 And as he died, blasphemed and cried—
 "Curs'd be this gun of mine!"

Still as the year comes duly round,
 Herne, from the infernal crew,
 Is suffered with his horn and hound,
 His pleasure to pursue.

A midnight ghost, he's seen to ride
 On Bagshot's gloomy plain;
 His voice is shrill, the pack, his guide,
 Then disappears again."

To prove the facts which I relate,
 And all the forest know,
 You'll find the truth of what I state,
 If you to Swinley go.

There, "Martin's Herne," a house hard by,
 Tom Martin kept for years;
 And on a sign-post, mounted high,
 Herne's picture still appears.

There are many allusions to places in the course of this ballad, of which I shall speak more particularly at a subsequent period of this history; suffice it to say in this place that the Inn here spoken of had its sign changed about the time of the pulling down of the old lodge at Swinley, and has ever since borne that of the "Royal Forester," a general appellation, which, although it rendered it less particular, did not alter the actual sense. A neat residence close by was also known by the same name, and this, creating some confusion, was, I believe, the true reason for the alteration. If any more faith can be placed in this than the other legends which have obtained concerning this man, it would seem that the heathy plain in this neighbourhood was the scene of his irreverent

exploits; for so far as the adventure which forfeited his life is here related, it has nothing remarkably improbable in it. But to return to the features of this wild country, which I shall refer to another chapter.

(To be continued.)

THE RURAL DISTRICTS OF BATH.

BY THOMAS FULLER, ESQ.

WEST of Bath is the busy village of Weston, remarkable for the abundance of laundresses and of schools, occupations and establishments in great request near large towns. The parish of Weston embraces a large portion of the rich valley west of Bath, having on its southern boundary the river Avon, and on its northern the high hill of Lansdown, part of which down is included in the parish. The whole of the country between ascends gradually from the banks of the Avon, in pleasing undulations, until the steeper rises towards Lansdown are approached; progress then becomes laborious, but the difficulties encountered are amply rewarded by the varied and charming views which meet the traveller at every turn, and having attained the summit of the hill, all sensation of fatigue is entirely dissipated in breathing the pure invigorating atmosphere of this high elevation; and in treading the soft level turf of this beautiful down the pedestrian cannot but be impressed with the happiest feelings, and fully appreciate the rich treat before him, in the boundless prospects not to be surpassed, if equalled, in England. When his wonder and astonishment has somewhat subsided, he will be able to distinguish at a little to the south-east, almost under his feet, the city of Bath, with its unrivalled creseents and other buildings. To the south-west at a greater distance is the large commercial city of Bristol, enveloped in the dark atmosphere of smoke issuing from the chimneys of its numerous furnaces and manufactories. Through the rich vale between these two cities, the River Avon pursues its winding course. Further off to the west the lofty hills in Monmouthshire are seen, with the noble River Severn, as it flows to the broad estuary of 'King's Road,' where, joined by the Avon, and increasing in width, assumes the name of "Bristol Channel." To the south are the Mendips and other high hills in Somersetshire, with Alfred's Tower near Stourton, and objects innumerable worthy of attention. If more is required the observer has only to turn in a northward direction, and a short walk brings him to a commanding view of the Cotswold Hills and the rich vale of Gloucestershire. A few steps further would take us into that county, but having no intention of going so far on this occasion, we will retrace our steps towards Weston, and descend the hill by the shortest paths through the fields to

the village, which is situated nearly in the centre of the parish, midway between the River Avon and Lansdown Hill, and about two miles from Bath, with which city it is connected by a good road. Numerous springs of water rise from the sides of Lansdown Hill, and uniting in their approach towards the village, form a considerable stream, which runs through the long street of the village, and taking afterwards a south-easterly direction, joins the River Avon.

On the north side of the village street stands the church, a building of much interest, which, although not in our province to describe, ought not to be passed by without observing, that notwithstanding an addition to the building, the church is still insufficient for the wants of the parishioners, many of whom from deficiency of accommodation are deprived the means of attending the ministry of the present excellent Vicar. If ever an instance existed of all the Christian virtues being united in one individual, that happy combination is to be found in the person of the amiable and highly-esteemed gentleman who now conducts with so much harmony and satisfaction the manifold responsible duties of his holy office.

The prevailing taste for suburban residences has created a great demand for houses outside of towns, and has caused the erection of ornamental villas and cottages to extend on every side, so as to unite with the villages adjoining. The union of Bath with Weston would long since under the influence of this popular feeling have been consummated, but happily for the inhabitants of Bath, and the admirers of Nature in particular, the beautiful meadows, known as the "Bath Common Fields," interpose, over which, thanks to the wise and benevolent provisions of our ancestors, no houses can be built. To the inhabitants of Bath is thus preserved a delightful space for recreation, the attractions of which have been much increased by a tasteful arrangement of shady promenades and agreeable drives; and from its proximity to the city, and its easy and gentle ascent, with the extensive and richly diversified prospects of the surrounding country, no spot can be more admirably adapted for the objects intended. The cost of these improvements was provided by subscription, and they were executed with great taste in 1830. On the 21st. of October in that year, the Duchess of Kent, accompanied by her illustrious and interesting daughter, the heiress presumptive to the Throne, arrived in Bath. The occasion of this visit was deemed an auspicious epoch for opening the new improvements, and a request was made to Her Royal Highness that she would be pleased, on her inspection of the different public buildings, etc., to make the *first circuit* of those improvements. Accordingly on the 23rd., the Royal visitors, attended by the Mayor, the Lord Bishop of the Diocese, and several other distinguished characters, with a numerous train of followers, entered at the principal approach from Bath, and after taking the circuit of the drive,

Her Royal Highness expressed the gratification which herself and the Princess had derived from their visit to the city, and signified her desire that in future the newly-formed pleasure grounds should be designated "The Royal Victoria Park."

The management of this valuable appendage to Bath is delegated to a committee of gentlemen and tradesmen, who are indefatigable in their care and attention. Protection to the feathered creation is not lost sight of, but notwithstanding the strict surveillance of the Park keepers, rude mischievous boys carry on their depredations, and manage to elude detection. Still in the abundance of trees and thick foliage of the evergreens, many of our native songsters who remain with us through the year find shelter, and during the late mild winter the notes of the Thrush were continually heard. But the Naturalist looks for more retired places; so let us leave the Victoria Park to fashionable loungers and pleasure-seekers, and proceed to the parish of Weston. We soon meet the stream of water, which, after leaving the village, flows through a rich dell, and passing under a bridge of one arch, over which is the turnpike road from Bath to Bristol, joins the River Avon, where it is known by the name of "Lock's Brook."

The windings of this dell to the junction of the brook with the river is to me a favourite resort. Here I have noticed the first appearance of the Swallows, and here also have I observed, but with very different feelings, preparations for the departure of these pleasing companions of our summer rambles. An instance of the latter came under my notice last October; the weather up to that time had been warm for the season, but on that day the chilliness of autumn was sensibly felt, and the leaves of the willows overhanging the river and the brook, dropped in great numbers, and the rapid approach of the shades of evening painfully impressed upon my mind the fact that the sun had left our northern hemisphere, and was journeying south.

Whilst thus musing upon the pleasures of the happy season just passed, and looking forward to the approaching trials of stern winter, my attention was attracted by the great number of Martins, as they flitted over the river with more than usual animation and chirrupings. "Ah!" thought I, "you happy beings will all very soon be following the glorious luminary into more southern climes, and all this bustle and chattering looks like preparation for the movement." Feeling much interest in the busy scene before me, I lingered upon the banks of the river watching the motions of the birds, remarking their gradual disappearance, and pondering in my mind as to where they could be disposing themselves. Occupied with these thoughts, and looking towards the brook, the trees which overhung the stream seemed to have undergone a complete change, every branch being covered with white spots. No rays of light were visible from any quarter

to account for this singular appearance; on the contrary, mist was rising from the river and darkness increasing. Being much puzzled, and seeing a countryman approaching, I drew his attention to the trees, and inquired if he knew the cause of the singular whiteness of all the branches. "Oh yes," said he, "that is from the Martins; all those spots we see are their white breasts as they perch upon the branches. They have enticed all their young ones from their nests, and have been teaching and exercising them upon the wing; they will return no more to their nests, and are now settled for the night in a body, so as to be ready for flight in the morning, and will all be off at early dawn." Nearer examination confirmed the truth of this statement; these white spots which had so perplexed me were indeed the breasts of these aerial travellers. Upon asking if he had ever witnessed a similar occurrence, "Oh yes," said he, "in a withy bed lower down the river, I have seen them gather together in the same manner."

Having noticed the statement of a correspondent in "The Times," "that he had seen a small flock of Swallows on the 30th. of March, near Dorchester," I was induced to watch for their return here more narrowly than usual, and on the 11th. of April saw them for the first time. There had been a sharp frost the night before, but the sun rose with majestic brilliancy in a clear, blue, cloudless sky, the genial warmth of his rays gave evidence of his being in our northern hemisphere. Myriads of gnats and other insects were on the wing, and a more beautiful day in April was never seen. It was Sunday, and immediately after leaving church, I proceeded to the dell spoken of, and never do I remember the glory and loveliness of the handiworks of Divine Providence opening with greater attractions.

As I stood on the bank of the brook lost in feelings of deep reverence and admiration, a Martin caught my eye; following the course of the stream I saw more, and upon arriving at the junction of the brook with the river, had the happiness of seeing our welcome visitors in great numbers, skimming and dipping the water, and wheeling in the air with all their characteristic rapidity of flight and quickness of evolution. The contemplation of so busy a scene of animated nature was delightful, and induced me to remain until near sun-set. Gilbert White says, "That during forty years attentive observation, he never saw them before the 13th. of April." The fact of having seen them before so close an observer and eminent authority would have been worthy of record, but for the announcement of the "Dorchester Naturalist."

The road from Bath to Weston is a favourite drive; beyond the village a steep lane leads to Lansdown. Other lanes branch off to villages adjoining, and numerous tracks and footpaths intersect the fields, leading to

farm-houses in different parts of the parish. These lanes and paths afford shady and agreeable walks to the pedestrian; but the contiguity of this naturally beautiful district to so large a town as Bath, tempts great numbers of city sportsmen throughout the winter season, who make sad havoc with the feathered creation. The few which escape, are, however, sufficient to add interest to the rambles which may be pursued in every direction, from the banks of the Avon on the south to the top of Lansdown on the north, and from east to west. The admirer of nature finds many attractions even at this rough time of the year, and looks forward with pleasing anticipations for the approaching spring. But with this genial season, to his great disgust and annoyance, comes another class of persecutors, in the persons of mischievous boys, who scan the fields, scrutinizing every hedge and tree in pursuit of birds' nests, so that in every walk one or more of the idle vagabonds is met with eggs strung upon a primrose stalk. These doings leave little encouragement to the naturalist; nevertheless the healthy freshness of the country air and its invigorating influence, fortify the mind, and dispose the lover of nature to make the best of such adverse circumstances.

The farms distributed over this extensive parish are in small holdings, being chiefly pasture lands, supporting dairies of cows, which supply a large proportion of the milk consumed in Bath. I take every opportunity of endeavouring to create among the farmers some feeling in favour of the feathered creation, but they are wholly indifferent upon the subject. Talking with one of these gentry a few days back, whose farm joins a mansion called Weston House, on one side of which is a shrubbery, where birds might be expected to congregate, "How is it," I inquired, "that so few birds are to be seen in this favourable situation?" In reply he repeated the same causes I have already noticed, adding, that formerly there existed a rookery upon the high trees near the house, but the ladies who then occupied the mansion caused the rooks to be destroyed. Thus it is that a beautiful rural district has been denuded of one of the greatest attractions the country can possess.

Bath, April, 1858.

Entomology.

A LIST OF THE INSECTS OBSERVED
IN THE SOUTHERN PART OF THE COUNTY OF SUSSEX.

BY W. C. UNWIN, LEWES.

NO IV.—INCLUDING THE LEPTIDÆ, BOMBYLIDÆ, SCENOPINUS, EMPIDÆ,
DOLICHOPIDÆ, LONCHOPTERIDÆ, CONOPIDÆ, AND MUSCIDÆ.

(Continued from page 93.)

LEPTIDÆ.—WESTWOOD.

Leptis scolopacea.—Not common. On the banks by the Winterbourn stream, in June.*L. trigaria*.—It has been observed, but rarely, in the neighbourhood of both Lewes and Brighton.*L. lineola*.—This species is by no means common, although frequently observed in this locality in June and July.*Chrysopila holosericea*.—Frequently obtained by sweeping the flowery banks in the Lewes levels, in July and August.

BOMBYLIDÆ.—WALKER.

Thereva plebeia.—By the sides of corn-fields, on thistles and other *compositæ*, in July and August.*T. annulata*.—Rare. Near the coast at Newhaven in July.*Bombylius major*.—Common in the Plashet and Warringore Woods, and also in Compton Wood, near Firle, frequenting the sunny glades in these localities on bright spring days, appearing in some years as early as March, but usually in April and May. Its habit of hovering in the air reminds us of the interesting Humming Bird Hawk Moth, (*Macroglossa stellatarum*.) so frequently noticed in gardens in August.*B. medius*.—In plenty on the first fine warm days of April, in the same localities as the last species, but seems to prefer the sunny banks of the skirts of woods. It is commonly called the Unicorn Fly and Sword Bee, from its long proboscis.

SCENOPINUS.—CURTIS.

Scenopinus fenestralis.—Of frequent occurrence in early spring.

EMPIDÆ.—LEACH.

Empis tessellata.—Plentiful, basking on the leaves of trees and shrubs in July; commonly in moist situations near Langport and Kingstone, near Lewes.*E. livida*.—Not rare. Generally obtained by sweeping the long grass on hedge banks in the neighbourhood in July.*E. femorata*.—Common. On *Umbelliferæ*, and by sweeping.*Hilara quadrivittata*.—Very common. Hovering and sporting at the close of day over running streams in little parties in May and June.*Rhamphomyia sulcata*.—Not uncommon among the grass by the sides of

ditches during the summer months, and on the leaves of aquatic plants, also on the blossom of the Meadow-sweet.

DOLICHOPIDÆ.—LEACH.

Dolichopus nobilitatus.—Very abundant on aquatic plants in the ditches in the Lewes levels in July.

Chrysotus viridulus.—Rare. Taken near Firle.

LONCHOPTERIDÆ.—CURTIS.

Lonchoptera punctum.—This little species is found very plentifully by sweeping the ditches from March throughout the summer.

CONOPIDÆ.

Conops quadrifasciata.—Not uncommon in the Plashet and Warringore Woods in August, on the flowers of the Common Ragwort, (*Senecio Jacobæa*.)

C. rufipes.—Frequents the same localities as the last, but more rarely observed.

MUSCIDÆ.—LATREILLE. DIVISION CALYPTERÆ.—MEIGEN.

Bucentes geniculatus.—Not common. Occasionally observed basking on palings in the sun in April and May.

Tachina grossa.—On the trunks of trees in the spring, but not common.

T. ferox.—Frequents the sides of corn-fields near the Downs, in June and July.

T. ursina.—Of frequent occurrence on *Umbellifera* by the sides of corn-fields, near the Downs, in June.

T. lateralis.—Very common on the blossom of the Cow Parsnip, (*Heracleum sphondylium*.) on hedge banks, in June.

Sarcophaga carnaria.—Abundant everywhere. Very variable in size. Its usual habit is to settle before you in pathways, either on the ground or on a stone, in the hottest sunshine; appearing from April to October. It is one of the species which may be seen frequenting the ivy blossoms.

Musca vomitoria.—Very common everywhere.

M. Cæsar.—Abundant on *Umbellifera*, etc.

M. domestica.—Most abundant, and particularly in the month of August.

M. rudis.—Frequents the windows of houses in early spring, and on walls facing the sun. Very common.

M. corvina.—Observed at Firle by a young friend from whom I have two specimens; he speaks of it as not being uncommon.

M. maculata.—Not rare near Lewes. A distinctly-marked species; it frequents walls and palings facing the sun.

Tetanocera dorsalis.—Occurs occasionally, and principally obtained by sweeping.

T. lineata.—One of the species which is the produce of the sweeping-net, but it is not common.

Borborus equinus.—Frequents the willow-blossoms in March and April.

Limosina limosa.—Most commonly observed in the windows of out-houses, also on walls near drains and gutters early in the spring.

Platystoma seminationis.—Not uncommon on the leaves of the Burdock,

(*Arctium lappa*,) by the foot-path leading to Ilford, in 1855, and has also been taken near Brighton. It does not appear to be very generally distributed, more particularly in the North of England.

Ortalis vibrans.—Occurs very commonly along hedge banks in July and August.

Trypeta arctii.—Not uncommon, and usually found on the blossoms of the Knapweed, (*Centaurea nigra*,) in July and August.

Sepsis cynipsea.—Abundant on the leaves of plants, and more particularly on those of the Strawberry in gardens. Appearing in May and June.

Chlorops circumdata.—In plenty in May and June near Landport and elsewhere, flying among, and settling on the leaves of bushes in the sunshine.

(To be continued.)

A LIST OF THE RARER SPECIES OF COLEOPTERA,
WHICH OCCUR, OR HAVE BEEN TAKEN IN
THE NEIGHBOURHOOD OF HARLESTON, NORFOLK.

BY J. LEEDES FOX, ESQ.

AND IN THE NEIGHBOURHOOD OF BUNGAY.

BY W. GARNES, ESQ.

[When no initial is affixed the insect has been recorded by each of the above gentlemen. The initials F and G respectively intimate that it has been observed only by the person to whom the said initial refers.]

(Continued from page 89.)

Grypidius equisiti.—Rare. (G.)

Dorytomus vorax.—Not uncommon at Beddingfield. (G.)

Lixus paraplecticus.—Once, by my father. (G.)

Magdalis cerasi.—Rare. (G.)

Rhynchites æneovirens.—Rare. (G.)

Monochamus sutor. Once. (G.)

Orchestes caprea.—This pretty little insect occurs frequently. (F.)

Balaninus villosus.—Occasionally in Gawdy Wood. (F.)

Leiosoma ovatula.—Sometimes in plenty. (F.)

Tanysphyrus Lemnæ.—Occasionally. (F.)

Oxytoma fuscirostris.—Rather scarce. (F.)

Aromia moschata.—Sometimes plentifully. (F.)

Pogonocherus hispidus.—Occasionally.

Saperda cylindrica.—I have taken two specimens near this town. (F.)

Leiopus nebulosa.—Occasionally. (G.)

Mesosa nubila.—Very rarely. (G.)

Saperda populnea.—Occasionally. (G.)

Tetrops præusta.—Occasionally.

Gracilia minuta.—Sometimes abundant. (F.)

Pachyta livida.—Common. (F.)

- Callidium violaceum*.—Once. (G.)
C. variabile.—Occasionally. (G.)
C. alni.—Occasionally. (G.)
Donacia menyanthidis.—Very rare. (G.)
D. cincta.—Frequent. (F.)
D. dentata.—Occasionally. (F.)
D. dentipes.—Occasionally. (F.)
D. sagittariæ.—Scarce. (F.)
D. rustica.—Plentifully. (F.)
D. Typhæ.—Plentifully. (F.)
D. Hydrochæridis.—Occasionally. (F.)
Crioceris puncticollis.—Plentifully in the autumn. (F.)
Cassida Murræa.—Sometimes abundantly. (F.)
C. obsoleta.—Occasionally. (F.)
C. vibex.—Occasionally.
C. sanguinolenta.—Once. (G.)
C. viridula.—Once. (G.)
Macrocnema nigricollis.—Occasionally at Beddingfield. (G.)
Anchenia 4-maculata.—Occasionally. (F.)
Thyamis 4-punctulata.—Very rare. (F.)
Chætognema aridula.—Frequent. (F.)
Chrysomela distinguenda.—Occasionally. (F.)
C. Gættingensis.—Scarce. (F.)
Cryptocephalus lineola.—Once. (G.)
Coccinella 14-guttata.—Occasionally.
C. 16-guttata.—Rarely.
C. ocellata.—Scarce. (G.) Only two specimens. (F.)
C. oblongo-guttata.—Rarely. (G.)
C. 13-punctata.—Rarely. (G.)
C. 19-punctata.—Rarely. (G.)
Endomychus coccineus.—Mr. Muskett has taken several examples in this district, but I have never met with it. (F.)
Platydema ænea.—Scarce. (F.)
Cteniopus sulphurea.—Occasionally. (F.)
Orchesia micans.—Frequent. (F.)
Mordella aculeata.—Rare. (F.)
M. primula.—Once. (G.)
Melandrya caraboides.—Occasionally. (G.)
Oncomera femorata.—Once. (G.)
Notoxus monoceros.—Occasionally. (G.)
Rhipiphorus paradoxus.—Mr. Muskett has taken numbers of these insects from wasps' nests in this neighbourhood. (F.)
 [It is common in the neighbourhood of Stowmarket, in wasps' nests.—ED.]
Anthicus antherinus.—Occasionally.

(To be continued.)

THE PSYCHIDÆ.

THE remarkable work of M. Siebold, upon "A True Parthenogenesis in Moths and Bees," which was during the year 1856, translated by Mr. Dallas, has no doubt been read by most naturalists in this as well as other countries. It would be idle to attempt to cast any doubt upon the startling facts contained in M. Siebold's work, at all events in the present state of the question. M. Siebold is one of the best observers in modern days; and this is saying much. We are not at present aware that his views have been called into question, or his facts doubted by any person of authority. That the subject is still incomplete, and that it offers a very wide field for further observation, (we would fain have added further confirmation,) M. Siebold himself admits.*

It may be interesting to our readers to know what were the opinions of M. Siebold, and the best authority on the economy of the *Psychidæ*, M. Bruand, only four years ago. M. Bruand, who opposes the theory of a *Parthenogenesis* in the *Psychidæ*, quotes triumphantly as his highest authority M. Siebold himself. The latter in the preface to his work admits his former scepticism, but adds, that modern histological investigations have given a much greater assistance to his later inquiries.

We copy the following from M. Bruand's monograph on the *Psychidæ*, trusting that it may induce some of our readers to look out for species in this country. Stainton (Manual) gives six species as inhabiting Great Britain, and places them among the *Bombyces*. M. Bruand has described and figured most beautifully eighty-two species; he places them among the *Tineidæ*.—ED.

Translated from the Introduction of M. Th. Bruand's Monograph on the Psychidæ.—This is one of the tribes most puzzling; one of those in which there are many errors, and errors difficult to establish by proof. The perfect insects in many species resemble each other strongly, especially the females, in whom the likeness is so strong, that even with the lens we can discover no sensible differences. As to the larvæ, the most exact figures can scarcely give an idea of the slight variations which distinguish them. The synonymes it is almost impossible to unravel, and we can readily imagine this, when we know that ancient authors in describing one of the species of this genus, did not suspect the existence of many other allied examples. Their descriptions are so vague that they may be applied indifferently to four, five, or six species. Add to this that the figures of Hübner are very incorrect, those of Duponchel deficient, and the others altogether imperfect. In such a position I had only one course to pursue, and that was to compare with each other the *Psychidæ* of different collectors of authority; then by giving a drawing *perfectly exact*, to stop all doubts for the future. This is what I have done, and my obligations are due for much information upon the subject communicated

* Any of our readers interested in this subject, would do well to read in addition to M. Siebold's little work, "The Alternation of Generations, or the Propagation and Development of Animals through Alternate Generations;" by J. J. S. M. Steenstrup, translated by Busk; Ray. Soc., 1844. Also on "Parthenogenesis, or the successive production of Procreating individuals from a single Ovum;" by Professor Owen, 1849.

to me by M. Boisduval, M. Lederer, M. Boyer de Foscolomben, M. Bellier de la Chavignerie, and M. Millière de Lyon.

The tribe which will occupy our attention presents great difficulties. On the other hand, the observing naturalist will find it a very interesting and attractive study. In reality there are few groups of insects in which infinite variety is more remarkable, or where Providence has more multiplied his admirable resources.

If it were only the mystery which some naturalists have thrown around the reproduction of the *Psychidæ*, it would add another attraction to the observer. In reality some entomologists have held that the reproduction takes place without a conjunction of the sexes. Pallas and Degeer have made known and defended this opinion. Others without going this length have affirmed that frequently the eggs of the different species produce at one time entire broods of males, and at another of females. These two questions have been the subject of an able and very conscientious memoir by M. D. Siebold. This naturalist, to refute the lovers of the marvellous, has appealed principally to anatomy, and has demonstrated triumphantly to my mind that the study of the generative organs in the two sexes, (parts quite distinct from those of reproduction,) must necessarily lead to the conclusion that the fertilization of the egg is the result of a conjunction of the sexes in the genus *Psyche*, just as it is in other genera of lepidoptera. I must, however, be permitted to find fault with M. Siebold. He places Reàumer among the authors who admit reproduction without contact with the male. Now these are his words:—"Would the males and the females of the *Tineidæ* be moths without wings? It is more likely that the male and winged moths, by which the female or females are fecundated, have escaped my notice; which may have happened from a variety of circumstances."—(Ins. III, p. 153, Paris, 1737.)

This phrase seems to lean rather to an opinion contrary to that which is attributed to him by M. Siebold. And I may take this opportunity of remarking that Reàumer was rarely deceived in his observations; that he examined and studied with a remarkable truthfulness and extraordinary patience; and that in his memoirs are to be found very precise observations upon insects which authors have thought they were noticing for the first time, more than one hundred years afterwards. I may notice among others *Carpocapsa splendana*, Ins. 77, p. 501-4; *Eudopisa pisana*, Guèn, same vol., p. 483; *Gracillaria syringella*, same vol., p. 242; *Psyche helicinella*, Ins. III, pl. 15, f. 20-22. *Psyche triquetrella*, same vol., pl. 15, f. 7, 8. M. Guènee, Ind. Europe, *Microlepidop*, says this figure is so coarse and large that we cannot recognise it. I own I think it very exact, and that it cannot cause the least doubt.

As to the second question, it is quite true that sometimes a brood produces one or two females only, to twenty or thirty males. At another time it will be quite contrary. It may happen that the entire batch only produces individuals of the same sex, without that circumstance bringing the least proof into the discussion; for if one batch of eggs only produces males, the next may furnish only females. We cannot therefore conclude anything from an isolated brood.

I can certify that I have observed many sets of eggs which have not

produced larvæ, not having been fertilized. On the other hand, I have obtained individuals of both sexes every time that I have made observations upon a dozen larvæ. If the contrary were many times established it would prove nothing conclusive. It has happened to me to raise a whole brood of *Aglia tau*, fifty-four chrysalides, and only one male. From this we can only come to one conclusion, that in certain species the male is much rarer than the female. In the *Psychidæ*, on the contrary, *the two sexes are in about equal numbers*; even the females predominate, as they do in many other genera. As to the facility with which we may be led to false conclusions, M. De Siebold gives many examples, and it is sufficient to make ourselves acquainted with the habits of the *Psychidæ*, to become convinced that in this genus, *more than in any other*, we are exposed to numerous errors. Thus I firmly believe that the two sexes are reproduced in the *Psychidæ*, as in other genera of the same order.—[Essai Monographique sur la Tribu des Psychides. Par M. TH. BRUAND, of Besançon. Paris, 1853.]

Notodonta cucullina.—Mr. F. O. Standish, in a letter dated May 12th., 1858, gives me the following interesting particulars respecting this insect:—In September, 1856, he had a few larvæ sent him. The moths made their appearance from May 11th. to June 16th., 1857; on the latter day he had a brood of fertilized eggs. These hatched, and produced full-grown larvæ about the middle of July; and from August 3rd. to 15th., of the same summer, eight moths made their appearance. The remainder are making their début this spring, (1858.) It would appear that the extraordinary heat of last summer had a double-brooded influence upon this insect, which has been always considered, by both British and Continental entomologists, only single-brooded. If any of the readers of "The Naturalist" have ever met with a parallel case, I hope they will communicate their experience.—H. HARPUR CREWE, Stowmarket, May 28th., 1858.

Liparis monacha.—In noticing this insect among the Lepidoptera of Suffolk, I expressed a doubt as to the correctness of the statement in several entomological works, that the larva feeds upon *fir*. I am happy to be able to set the matter at rest. My friend Mr. Bond informed me the other day that he had several times both taken and bred the larvæ from the Scotch fir, (*Pinus sylvestris*.)—Idem.

O. gonostigma.—At page 53, No. 59, "Intelligencer," 1857, Mr. Machin gives us a most interesting account of his having bred a second brood of this insect in August and September, from eggs laid in July of the same year. This moth has always been considered single-brooded in England, and probably the unusual warmth of last summer was the cause of this apparently abnormal occurrence. I find, however, that on the continent it is generally, if not always, double-brooded. M. Guenée and Duponchel remark:—"L'insecte parfait se montre pour la première fois à la fin de Mai, ou au commencement de Juin, et pour la seconde en Aout, Septembre, et Octobre." The perfect insect appears for the first time at the end of May or beginning of June,

and again in August, September, and October. It is therefore by no means improbable, that in warm summers, like that of 1857, *O. gonostigma* is double-brooded in the wild state in England.—Idem.

Notodonta trepida.—On May 27th., I bred a very fine female *N. trepida* from a pupa dug up the previous autumn. The following evening was warm and cloudy, and being very anxious to secure an eligible husband for my fair protégé, I took her up to the nearest wood at half past seven p.m., and having deposited her upon the stem of a large solitary oak, just outside the wood, I left her to her devices and returned home. At half past ten I donned my lantern and again sallied forth. Upon arriving at the tree I found that my fondest hopes were realized. The fair one had been wooed and won by a young gentleman of magnificent stature and unexceptionable appearance, and the nuptial knot was tied. The female soon battered herself to pieces, but laid a goodly lot of eggs. The male now graces my collection. I need not say that I thought myself fully repaid for my four miles walk in the dark. The eggs laid May 29th. and 31st., began to hatch June 5th. I hope I may be more fortunate with the larvæ than I was last year. On June 2nd., while walking up from Woolwich to Shooter's Hill, I espied on one of the lamp-posts on the Common, what I took to be a male *Cerura vinula*. Having climbed up and secured my friend, I found him to be a very large but rather worn male *N. trepida*.—Idem.

Asthenia luteata.—The larva of *A. luteata* appears to be, comparatively speaking, unknown. It is a small, pale green and rather hairy larva, in shape somewhat resembling some of the *Eupithecia*, and feeds on maple in August. I have for two or three years past been in the habit of beating it, but never reared it till last week. I always took it to be a *Eupithecia*.—Idem.

Ceropacha ocularis.—A splendid female of *Ceropacha ocularis* made its appearance in my cage last night, (June 13th.) I dug the pupa under loose bark at the foot of a large poplar, January 11th.—Idem.

Notodonta cucullina.—One of the two larvæ of *N. cucullina*, which I took in this neighbourhood, August 18th., 1857, produced a fine male, June 12th.—Idem.

Rapidity of growth in larvæ of the Notodontæ.—Mr. Greene doubts the possibility of a *Notodonta* larva hatching and feeding up in the course of a month. Mr. F. O. Standish informs me that last year two larvæ of *N. Carmelita* fed up in very little more than a fortnight.—Idem.

Capture of Micra Ostrina.—We have much pleasure in recording the capture of this hitherto rare species by Dr. Battersby and his daughter, near Torquay. Its habits appear to resemble those of *Acontia luctuosa*, which the same gentleman took last year in considerable numbers. Dr. B. has secured three specimens of *M. Ostrina*, and will no doubt find many more. The only other known British specimen was taken at Bideford, in the same county in 1825.—Ed.

Clouded Yellow Butterfly.—I took a fine female Clouded Yellow on Tuesday last, the 8th. of June, which is, I think, an extraordinary event. The specimen was seen alive by at least ten persons, and that it was just out from chrysalis, as the spaces between the nervures bore that limp condition which is observable in insects before the wings have become stiff by flight. The same day I had the good fortune to take a specimen of *M. cinxia*, rather an event with me.—J. WESLEY, The Close, Winchester, June 11th., 1858.

[The 8th. of June is the earliest date I have ever known of the occurrence of *Electra*. The earliest previously recorded was the 29th. of that month. I should be glad to hear more of the occurrence of *Cinxia*; if taken near Winchester, the date, the exact locality, etc. I have heard of its capture lately in Lincolnshire, but suspect that *Artemis* was mistaken for it.—F. O. MORRIS.]

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 140.)

Phalangista Cookii, Cuv. *Desm. Tem.*
Schinz. *P. Banksii*, Gray.
Phalangista fuliginosa, *Ogil. Schinz.*
Phalangista felina, *Wag. Schinz.*
Phalangista canina, *Ogil. Schinz.*
Phalangista Xanthopus, *Ogil. Schinz.*
Phalangista viverrina, *Ogil. Schinz.*
Phalangista incana, *Schinz.*
Phalangista nana, *Geoff. Desm. Schinz.*
P. gliriformis, *Linn.*

PETAURUS.

Petaurus taguanoides, *Schinz.* *Phalanger taguanoides*, *Geoff.* *Didelphys Petaurus*, *Shaw.* *Petaurista taguanoides*, *Desm.*
Petaurus macrourus, *Desm. F. Cuv.*
Schinz. *Didelphys macroura*, *Shaw.*
Petaurus flaviventer, *Desm. Les. Schinz.*
Petaurus breviceps, *Schinz.* *Belidea breviceps*, *Gould.*
Petaurus sciureus, *Less. Schinz.* *Didelphys sciurea*, *Shaw.*
Petaurus Peronii, *Desm. F. Cuv.*
Schinz.

Petaurus Ariel, *Schinz.* *Belidea Ariel*, *Gould.*
Petaurus pygmæus, *Less. Fisch. Schinz.*
Petaurista pygmæa, *Desm.* *Didelphys pygmæa*, *Shaw.* *Acrobates pygmæus*, *Desm.*

DENDROLAGUS.

Dendrolagus ursinus, *Müll. Schinz.*
Dendrolagus inustus, *Müll. Schinz.*

PHASCOLARCTOS.

Phascolarctos cinereus, *Schinz.* *P. fuscus*, *Desm.* *Lipurus cinereus*, *Schreb. Waterh.*

HYPSIPRYMNUS.

Hypsiprymnus murinus, *Pander et d'Alton. Schinz.* *H. setosus*, *Ogil.*
H. Peronii, *Waterh.* *Macropus minor*, *Shaw.*
Hypsiprymnus micropus, *Gould. Water. Schinz.*
Hypsiprymnus Whitei, *Schinz.* *H. Philippi*, *Ogilby.*

Hypsiprymnus penicillatus, *Watreh. Schinz.* *H. murinus*, *Ogil. Bettongia penicillata*, *Gray.*

Hypsiprymnus Gilberti, *Gould. Schinz.*

Hypsiprymnus Ogilbyi, *Schinz. Bettongia Ogilbyi*, *Gould.*

Hypsiprymnus cuniculus, *Ogil. Water. Schinz.*

Hypsiprymnus rufescens, *Schinz. H. melanotis*, *Ogil. Bettongia rufescens*, *Gray.*

Hypsiprymnus Grayi, *Gould. Schinz.*

Hypsiprymnus campestris, *Schinz. Bettongia campestris*, *Gould.*

HALMATURUS.

Halmaturus giganteus, *Schinz. Macropus giganteus*, *Shaw. M. major*, *Shaw. Gray. Cuv. Schreb. Didelphis gigantea*, *Linn. Kangurus labiatus*, *Geoff et Desm.*

Halmaturus fuliginosus, *Schinz. H. griseo-fuscus*, *Gold. Kangurus fuliginosus*, *Desm. Fr. Cuv. Geoff.*

Halmaturus laniger, *Schinz. Macropus lanigerus*, *Griff. Kangurus laniger*, *Geoff. Wag. Schreb. K. rufus*, *Desm.*

Halmaturus unguifer, *Gould. Waterh. Schinz.*

Halmaturus frænatus, *Schinz. Macropus frænatus*, *Guld. Water.*

Halmaturus lunatus, *Schinz. Macropus lunatus*, *Gould. Water.*

Halmaturus leporides, *Schinz. Macropus leporides*, *Gould. Water.*

Halmaturus Parryi, *Schinz. Macropus Parryi*, *Bennet. Water.*

Halmaturus elegans, *Schinz. Macropus elegans*, *Lambert. Water.*

Halmaturus Bennetii, *Schinz. Macropus Bennetii*, *Water. M. fruticus. Ogilby.*

Halmaturus albus, *Schinz. Macropus albus*, *Gray. Water.*

Halmaturus ruficollis, *Goldfuss. Water. Schinz. Kangurus ruficollis*, *Desm. Macropus ruficollis*, *Less. Fisch.*

Halmaturus rufo-griscus, *Schinz. H. griseo-rufus*, *Goldf. Geoff. Wag. Macropus rufo-griseus*, *Desm.*

Halmaturus nemoralis, *Wag. Schreb. Schinz. Kangurus ualabatus*, *Less. K. Brunii*, *Desm. Fr. Cuv. Geoff. Macropus ualabatus*, *Fisch.*

Halmaturus Irma, *Schinz. Macropus Irma*, *Jourdan. Water.*

Halmaturus leptonyx, *Wag. Schreb. Schinz.*

Halmaturus Brunii, *Schinz. Didelphis Brunii*, *Schreb. Kangurus veterum*, *Less.*

Halmaturus manicatus, *Schinz. Macropus manicatus*, *Gould. Water.*

Halmaturus Billardieri, *Schinz. H. brachytarsus*, *Wag. Schreb. H. Tasmanei*, *Gray. Macropus rufiventer*, *Ogilby.*

(To be continued.)

Miscellaneous Notices.

Migratory Birds.—Migratory birds were very early with us this spring. I saw a single Swallow on the 11th. of April, and fifty or sixty Swallows and Martins a fortnight afterwards. The Cuckoo we heard on the 18th. of April. A gentleman's gardener in this parish has got a specimen (stuffed) of the Hairy Woodpecker, which he shot himself; they are rather scarce birds in our clime, I believe. A Picfinch has contributed

to the materials of his nest a portion of an old Greek lexicon, which the boys at the Grammar School at Bromsgrove had torn up for "hare and hounds" purposes.—H. ALDHAM, Vicarage, St. Prior, May 12th., 1858.

[With us, here in the north-east, migratory birds were, for the most part, unusually late this spring—I suppose from our proximity to the east coast, and the prevailing cold winds from that quarter. I should like to hear more about the Hairy Woodpecker. The Piefinch is, I suppose, the Chaffinch; indeed, if I remember aright, as an old Bromsgrovian, [it is one of the Worcestershire vernacular names of that bird.—F. O. MORRIS.]

Peregrine Falcon.—A Peregrine Falcon was shot near Newmarket, Cambridgeshire, December 15th., 1857. It was an adult female.—SAMUEL PARKER SAVILL, JUN., 13, Regent Street, Cambridge, May 15th., 1858.

Spotted Crake, (*Rallus Porzana*).—On the 23rd. of April I had the good fortune to obtain a male of the above elegant Crake, shot by the side of the River Cam, Cambridge.—Idem.

Norfolk Plover, (*Charadrius Œdicnemus*).—In a fallow field a short distance from the village of Yelling, Huntingdonshire, a fine male Norfolk Plover was shot. A gentleman in the neighbourhood informs me he never before knew of one being obtained in the above locality.—Idem.

Greater Spotted Woodpecker, (*Picus major*).—I have a specimen obtained at Swaffham Priory, Cambridgeshire, April 24th., 1858.—Idem.

Blue-winged Teal.—A specimen of the Blue-winged Teal, (*Anas discors*), was shot near here a few weeks ago. Can any of the readers of "The Naturalist" inform me if it has been met with in Great Britain before.—W. G. GIBSON, 75, High Street, Dumfries.

Letter-box Birds' Nests.—A day or two ago we heard of a bird's nest in the letter-box of Whippingham Post Office, Isle of Wight. Here is a parallel case from a London paper, as recorded by a Belgian journal:—"At Heigne, near Charleroi, a Tom-tit has built its nest in a corner of the letter-box, and has there laid eight eggs, which, for some days she has been engaged in hatching. Though letters are dropped into the box, she takes no notice of them; and when the postman opens the box to collect the letters, she manifests no fear."—F. O. MORRIS.

Curious circumstance.—A few days ago a Tom-tit was seen to go into a hovel in the occupation of Mr. Joseph Symonds, at Over, and his brother having suspicion that it had a nest somewhere about, at last discovered it in the pocket of one of his own waistcoats. It had laid six eggs, and is now sitting upon them undisturbed.—*Newspaper Paragraph*.

Occurrence of the Hoopoe in Sussex.—Mr. Vidler, superintendent of Pevensey Levels, informed me that he had seen a Hoopoe on the 29th. of April, that had just been shot by Mr. Ade, farmer, of Charleston, near Alfriston, Sussex. It was very thin, and half of the under mandible was shot away. A. E. Knox, Esq., in his charming “Ornithological Rambles in Sussex,” says, “It has been killed in different parts of Sussex, generally near the coast.” That I can fully bear out, as I can mention one in my own collection, one at the New Inn, Eastbourne, and several in the collection of Mr. Albert Vidler, of South Street, Eastbourne, Sussex.—JOHN DUTTON, South Street, Eastbourne, (formerly of Hammersmith,) May 3rd., 1858.

Rare Birds in Leadenhall Market.—When staying in London, in April last, I procured, in the market one day, a magnificent specimen of the Great-crested Grebe, (*Colymbus cristatus*,) It was exactly in the state of plumage so faithfully portrayed in Morris’s splendid plate. I also was fortunate enough to obtain a fine specimen of the Gadwall, (*Anas strepera*,) in the delineation of which the reverend gentleman has also been most happy.—Idem.

TO FLORENCE NIGHTINGALE.

AMISSOS queritur fœtus Philomela sub umbrâ,
 Ipsa magis liquidis commemorata modis;
 LUSCINIA ast nobis FLORENTIA gratius olim
 Carmen, et auspicium, spe meliore, dedit;
 Letitiæ voces, blandi medicamina vultûs,
 Indefessa manus—Relligionis amor—
 Hæ tibi erant artes, O spectatissima Virgo!
 Freta quibus, magnum mens tua gessit opus:
 Nobilis ante alias, vives, Lux splendida sæeli,
 Nec fama evadet, nec morietur honos;
 Anglica te Tellus—pia te Regina beabit—
 Te servata cohors, te sacer Ipse Deus!

REV. W. H.

Proceedings of Societies.

East Kent Natural History Society.—(Continued from page 146.)—A fourth—and I am sure you will say not a small advantage—aimed at by this society, is the admission of the fair sex into its ranks. To them the study of shells, insects, and flowers, is peculiarly suited. The exquisite

forms and colours of the first; the beautiful and marvellous transformations and pencillings of the second; the fragrance and lovely hues of the last, seems essentially adapted to elaim their attention and fostering care. And it has ever been a source of great surprise to me, that out of the large number of collectors, so few ladies should be enlisted in the pursuit. But a new era is, I hope, about to dawn, and that the Fair Maids of Kent, by taking the offer of this society to enrol themselves as members, will show to the world at large, it is not their wish to be exeluded from learned societies.

I will only name another advantage a society like the present offers.

It keeps a correct registry of Natural History, for reference, of every interesting fact occurring within its district. This is of great value, not only to those belonging to the society, but to others engaged in unravelling the mysteries of the science, who, perhaps, by the acquisition of a fact thus registered, may complete a chain of evidence to the perfect elucidation of his theory.

We will now proceed to inquire into the nature of the society, which we are most anxious should be better understood by all classes.

The study of Natural History, next to that of religion, is the most ennobling to which the human mind can give its attention; since it not only leads it to a closer insight into the marvellous works and laws of Creation, but insensibly draws it nearer and nearer to that glorious Being, whose infinite wisdom could alone have formed so vast and beautiful an universe, which is yet governed by laws so wonderfully simple. Thus, step by step, as we advance in this study, we are more and more forced to acknowledge the Divine Power, and from the contemplation of his works, to adore their Creator.

In pursuing this delightful subject, one thing has always most forcibly struck me as a conclusive answer to those who seek to disparage the proceedings of the students in Natural History, that is what it has pleased the Almighty Power to form, cannot degrade the human mind to study; and therefore, we would throw a veil of pity over such hearts, so little elevated by the revelations of creation—so dead to the wondrous harmonies of nature. But the labours of such men as Linnæus, Buffon, Cuvier, Humboldt, and many others, are now spreading far and wide their fruitful seed, which neither empty satire can injure, nor impertinent ridicule uproot.

To give a remarkable illustration of the harmonies I speak of. A bone was presented to Professor Owen, (than whom, few countries can boast a brighter star,) and on examining it carefully, he pronounced it to be the leg-bone of a bird; and from deductive reasoning, based upon the simple, articulating surfaces, he erected the skeleton of a bird, such as had never yet been known to science—a wingless bird. And only a

short time elapsed before other osseous remains, belonging to the same species, arrived from New Zealand; and his greatest triumph was achieved on seeing a small living specimen brought over from that country, and which, no doubt, many here present, have seen in the London Zoological Gardens; I allude to the extraordinary little *Apteryx*. Here was a noble result of mental combination, of truthful appreciation of nature's undeviating laws, of harmony in its most perfect form. But we may look, and examine where we will, throughout the whole structural arrangement of nature, we find this wonderful principle ever existing. And from man down to the lowest and simplest form of created being, a chain connects one type with another, by a succession of links,—a series of shades and shadowings, that leads the mind imperceptibly onwards and onwards, descending the scale of organic creation, until it verges on that dark and mysterious threshold, where life begins and inanimate nature ends; where growth by secretion separates from inorganic growth by accretion; where the first principle of life bursts into existence, to upwards soar with increasing attributes, till it culminates in the marvellous structure of man!

The mind becomes almost prostrated at the vast field laid open for exploration, at the immensity of the design, at the myriads of living things permeating the air and the water, the surface and the under surface, all combined together—all forming one magnificent whole of symmetry and beauty!

It is by the division of Natural History into classes, that relief is afforded to the almost overwhelmed intellect. These classes are again separated into families, and families are subdivided, so that by taking a section of any part, it will be more readily mastered; and when this is attained, by the connecting links, other groups may be brought under examination, until the mind, like a spring welling from its head, onwards and onwards it gathers as it goes, now a rivulet—then a brook, a stream, a river—until finally it blends with the waters of the mighty ocean.

The East Kent Natural History Society, as its name implies, is in some measure, a purely local gathering; yet, doubtless many of its members belong to other societies.

From one and all, it is to be hoped, that that influence may be given, which will induce the poorer classes to become, in their leisure hours, gleaners in this charming study. In an opening address like the present, I believe it will be better to restrict myself to speak of those divisions of Natural History, within the compass of all to study, and in which East Kent is extremely rich in specimens. Therefore we shall select—ornithology, or the history of birds; entomology, or the history of insects; conchology, the history of shells; zoophyta, includes the zoophytes; and

botany, the study of plants. I shall only now allude to ornithology, entomology, and botany; but I believe you will find specimens of all branches in the room. Three-fourths of the eastern division of the county of Kent is bounded by water. It is the nearest land to the continent; therefore the lover of birds may collect in our districts many very rare specimens—the golden oriole, the roller, the waxwing—many of the hawks, and most of our summer visitors—the Dartford Warbler included, and several varieties of snipe. The great extent of sea coast necessarily makes us acquainted with numerous water-fowl. Consequently there is ample room to make a very valuable collection of British birds, with the kindred study of their eggs.

(To be continued.)



The Retrospect.

I have just received a letter from Dr. Hobson, of Leeds, who says "Mr. Waterton has most solemnly assured me that in naming 'the controversial papers' in the preface he did not allude to you in any way whatever." When a gentleman makes such an assertion I am bound to believe him, and as a matter of course I accept the disclaimer, and am really glad to have the inference removed, which the words in the preface had previously led me to entertain. F. O. MORRIS, June 17th., 1858.

IN "The Naturalist" for this month, Mr. Round, in the second chapter of his very interesting "Natural History of Sunninghill," states that place to be longitude 40° west, and latitude 25° ; adding that it is twenty-four miles west of London. Permit me to observe that the geographical situation of London is longitude $0^{\circ} 6''$ west, and latitude $51^{\circ} 00''$ north. It therefore follows that Sunninghill, being distant from London twenty-four miles, west, the difference can only be that much more (about half a degree) in longitude; and the latitude nearly the same at both places.—THOMAS FULLER, 2, Grafton Place, Bath, June 5th., 1858.

Exchange.

Dr. W. H. Rooke, Belvidere Cottage, Scarborough, has duplicates of the following eggs, which he would be happy to exchange for others.—Merlin, Kestrel, Sparrow Hawk, Long-eared Owl, Spotted Flycatcher, Redstart, Whinchat, Reed Warbler, Nightingale, Greater Pettychaps, Gold-crested Wren, Lesser Pettychaps, Skylark, Red Grouse, Goatsucker, and Common Cormorant.—May 14th., 1858.

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THE ENTOMOLOGICAL DEPARTMENT

BY C. R. BREE, ESQ.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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NOTICES TO CORRESPONDENTS.

Communications, Drawings, Books for Review, and Parcels, to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York.

Advertisements to be forwarded to Messrs. GROOMBRIDGE & SONS, 5, Paternoster Row, London.

ENTOMOLOGY.

Communications have been received by C. R. Bree, from THE REV. J. GREENE; —REV. H. H. CREWE, (two);—MR. A. SIMPSON;—MR. BAKER;—MR. KING;—MR. GASCOYNE;—MR. KIRBY;—REV. F. O. MORRIS, (four.)

MR. KIRBY, *Brighton*.—Many thanks for your communication. Your list contains only insects common everywhere, and therefore its publication would not be interesting to the readers of "The Naturalist." Do not be discouraged—try again.

* * In consequence of Mr. Bree's change of residence, all communications for the Entomological department of "The Naturalist," must be addressed after August 14th., next, until further notice, to MR. FAWCETT, *East Lodge, Driffeld*.

TO ADVERTISERS.

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Advertisements to be sent in not later than the 15th. of the Month.

THE GAIT OF BIRDS.

BY O. S. ROUND, ESQ.

(Concluded from page 124.)

I do not profess to give any account of foreign birds, except incidentally, but I may mention in passing that I believe we have, in this little island, almost every species of birds known to the ornithologist, with only one or two exceptions, that is the foreign kinds, are only other varieties of the genera which are found with us. If this is admitted, the habits of feeding, flight, song, and movement upon the legs, which I have endeavoured to illustrate and describe, will be generally applicable, and open the mind of the young naturalist to other and deeper speculations. Flight, it is true, is one of the most distinguishing attributes of the feathered tribes, and whether we think of it generally or scientifically, is a most beautiful and graceful movement; but these interesting works of Nature are so far removed from us when on the wing, or if near are so rapid, and consequently so transient in their movements, that our ideas of them, only thus collected, would probably convey a very imperfect impression of their true characters and appearance to our minds, and therefore their *gait* it is which renders them most familiar to us; this I have attempted in the foregoing pages to describe, and distinguish that which properly belongs to each tribe or order, but to shew how much it conduces to set off and render still more attractive by its singular fitness to their several bodily conformations, would be far beyond my skill to describe.

I suppose the shape and mechanism of a bird's leg and foot, is at once one of the most elegant and finished works that can be imagined. We talk of a Duck's splay foot, but see him gliding placidly over the bosom of the clear stream, and see that very foot in its pellucid situation, its yellow hue, shewing still more clearly its elegant movement, and then see if we shall ever again so speak of it. Look at the exquisitely-slender legs of any of our small birds, and only examine the little suit of horny armour in which they are enveloped, the Indian-rubber-like substance which protects the seemingly fragile toes, and I am persuaded you will feel a pleasing and wondering admiration. Turn, then, to the birds of prey, and see the mighty and formidable claws with which they are provided, albeit it may be for a cruel purpose;—it is their nature, and we must not inquire further, for those portions of the boundless scheme of nature, which we do faintly comprehend, display to us such wonderful fitnesses to their purposed ends, that we cannot doubt of a like wisdom (although inscrutable to our limited faculties) being displayed in all. Look at the web-footed which swim, and the superior mechanism—we may almost call it—of those that dive, the partial elongation or extension of the membranes of the toes of

those which frequent both land and water. Thus the Phalarope has a foot very much resembling that of the Coot, though on a smaller scale. Then the Heron, that mighty fresh-water fisherman, is said to have a peculiar character of leg, the scales being supplied with a singular attractiveness, causing fish, within a considerable distance, immediately to resort to the place where he stands, so that, with his keen eye, he darts upon them and feasts at his leisure. It is likely to suppose that it is an oleaginous juice residing in the *rête mucosum*, or under skin of the leg, which is this attraction; for the skin and marrow are dried, and used as a ground bait, and is said to be very effective. I merely refer to this a received opinion, but do not vouch for its accuracy. The middle claw of each foot is also furnished with a sort of comb, or is pectinated; this is probably used by the bird as a comb, for his feathers are both long and coarse; it is, however, a curious fact that this bird and the Nightjar or Fern-Owl, are the only two which possess this peculiar formation, and no two birds, I suppose, can be more dissimilar in their habits and appearance. The Heron also I may mention in this place, is a percher, and builds in trees in companies.

I have spoken of birds which have no hind toes; this is the case with nearly all the Plover tribe and the Curlews, but the Woodpeckers have a curious formation by which they are enabled to move the outside toe on either foot either forward or backward, as inclination or occasion may require; this, it is obvious, is a very useful provision on such very rugged and unyieldly surfaces as they must constantly meet with. Curiously enough, the Cuckoo, which is a pure percher, has the same form of foot, but this is probably for the purpose of supporting him in a better balance than his short leg would otherwise accomplish. The Parrot and Crossbill tribe have the same power, but the Swift or Black Swallow has the most curious foot of any known bird; his legs are very short, and he has four toes of equal length on each foot, which all move independently of each other, and are formed for clasping, so that he can climb with great facility, which is very useful in ascending under the narrow eaves of houses, where they have nests, and which by their position they could not otherwise so conveniently enter.

All the perching birds are endowed with strong claws more or less, and these are not only useful in their every-day life on trees, but chiefly during the night-time, when at roost, to preserve them from falling, to which the position of their bodies also contributes. Thus Cormorants, Gannets, and birds which must brave the tempest on the bleak pinnacles of the sea-girt rocks, have sharp claws at the extremities of their large webbed feet, and thus they obtain a firm hold or footing in those difficult situations, besides being of advantage in securing their slippery prey.

The legs of the tenants of air are hardly understood by persons who have not studied anatomy; what we call the leg answers to our foot, and what we call the foot is nothing more than the mere toes; therefore what we consider the thigh in birds is the true leg, although it is true that from using the toes only as in contact with the ground they are furnished with cushions—the attributes otherwise of a foot. The thigh is sometimes covered with long feathers, particularly where it is thick and brawny, as in birds of prey, such as Owls and Hawks; this, however, does not appear to be the only case in which feathers are here present, for we find them on the toes of those birds which have no extraordinary calls for pedal exertion, except in running. Thus all the Grouse are feathered down to the very nails, although this clothing rather partakes of the character of down or hair. The Martin, a small, weak, little bird, has the most beautiful covering of soft white feathers, which completely cover his legs and feet, and his only exertion lies in clinging to the spherical sides of his nest. The Bantam Fowls, which are foreign birds, have their feet covered with true feathers, as have the Cochin China Fowls, now so common, and these have such large and powerful legs as to be ungainly. The domesticated *Gallinæ* have great powers of leg, and are good runners, which power they exhibit particularly in their contests, which are often obstinate enough to continue to the death. The male birds of all this class are furnished with spurs, which are formidable enough, and made the vehicles of much brutal amusement; and it is no small disgrace to some members of our nobility that this inhuman practice has been upheld by their countenance and presence, until of late years; but I trust and believe that it has fallen into considerable disuse, and now practised only by the lowest and most degraded of the community. The Lark tribe are also furnished with what are called spurs, but are in reality nothing but an elongation of the nail of the hind toe, and they are not pugnacious birds.

Having considered the motions of birds in walking, running, clinging, and perching, with reference to each distinct peculiarity or modification of those several habits, I shall, in conclusion of this branch, devote a few words to the subject in general. Birds being biped, or two-legged animals, like ourselves, have many more difficulties to overcome in the balance of their bodies than quadrupeds, or those which have four supporters. It is true that they are not exclusively confined to the earth, not even where they cannot fly; but walking or standing is still but a secondary consideration with most, and yet they exercise it in much more trying situations than we, who are biped also, have to contend with, whether we reflect upon them as poised on the giddy and slender top of the vast pine, or perched on the dizzy peak of some naked rock of the tempestuous ocean; yet in whatever situation they are placed, the powers given to them by a bountiful

Providence are always found to be wonderfully applicable to such emergencies, as I have endeavoured to shew; and setting aside all this, how exquisitely graceful are all their movements; the slope of the foot cannot possibly be calculated more aptly for elegance or firmness, the very shape of the toes is incapable of improvement, and the whole considered either as an indispensable appendage, or beautiful ornament, is like all other of God's works, perfect in itself.

Richmond Terrace, Westbourne Grove, July, 1858.

RAMBLES BY RIVERS.—No. I.

BY SAMUEL HANNAFORD, ESQ.

THE MOORABOOL.

“Hic gelidi fontes, hic mollia prata.”—VIRG.
Here are cooling springs,—here grassy meads.

WE are a believer, to some considerable extent, in old Izaak Walton's saying, and have found it as he did, to be a real truth, that the mere sitting by a river's side, is not only the quietest and fittest place for contemplation, but will invite one to it. A Spanish writer, too, says that “Rivers, and the inhabitants of the watery element, were made for wise men to contemplate, and fools to pass by without contemplation.” Now, although we do not for one moment pretend that our rivers rival those of Epirus, or Sclarus, or the dancing waters of Elusuria, mentioned by our quaint piscator, or even those by which we have strolled at night-fall in the old country—the shrill scream of the Otter, the chorus of the Nightjar, the splash of the Water Rat, the only sounds which disturbed the stillness, save and except the rising now and then of a splendid trout to our fly, (for a lover have we been too of the gentle craft, and a paper of hackles even now brings up to our mind's eye all the old scenes,) still they have their own beauties, and we will be their champion, enlarging, as we deem worthy, on their merits or otherwise. Have you ever visited the Moorabool, dear readers? If not, then take advantage of the first fine day which offers itself, and away with you afoot to judge for yourself of the natural charms of this much-maligned stream;—slow, and paltry, and sluggish we have heard it called, but to it nevertheless we went, for we are not of those who are led away by popular prejudice, and there we beheld enough to clear it ever, in our eyes at least, from the slur cast upon it. Let us walk now to the bridge at Fyan's Ford, about two miles from

Geelong: here the banks remind us of the dark glen-like scenery of some parts of Ireland,—high hills, whose declivities reach to the water's edge, dark hollows intersecting, into which the daylight scarcely seems to glance. The first object we meet with here is the Black Fan-tailed Flycatcher, a bird whose breast is pure white, and the remainder of its plumage jetty black, ever darting from place to place, wagging its tail as it alights;—and then we have the glorious feeling of hiding,

“and abiding
From the common gaze of men,
Where the silver streamlet crosses
O'er the smooth stones, green with mosses,
And glancing,
And dancing,
Goes singing on its way.”

Small as the stream is here, its banks are indeed lovely to behold, planted, as they are, with rich dense masses of the fresh green sca-rush, (*Scirpus maritimus*), known to many by the rivers near the sea at home, from the cover of which we start a fine pair of Bitterns, who fly heavily and lazily away; the delicate convolvulus twining elegantly around the stems of the loosestrife, the pink flowers of which are always attractive; and then the lovely white crimson-marked flowers of the *Damasonium*, just peeping, nymph like, above the surface of the water, on which its dark green leaves float refreshingly; our old friend, the vervain, is here too, and the pretty pink *Melaleuca paludosa*. The crow's nest which you see some fifteen or twenty feet above you on yonder tree, shows that floods have there deposited portions of palings and brushwood, swept away during the winter from the residences of settlers higher up; indeed it is said the water on one occasion rose above the bridge itself. How merrily rushes the stream over its pebbly bed, musical as a young girl's laugh, anon widening and becoming deeper, flowing quietly and gently like the more mature thought of manhood. The very scum in some parts teems with animal life, lightly skimming the surface of the water—

“———Flumina libant
Summa leves.”—VIRG.

And it is of the contents of this same, which we so carefully put aside in our bottle, that we intend to discourse. Here are beauties such as many of you have never even imagined, those green hair-like tufts are sufficient to keep the mind on the alert for months to come; and see, too, with the naked eye even, how many thousands of shells we can detach with care,—in fact, we have an impromptu *aquarium* in which these will thrive for many a long day. But they are only shells, we fancy already we hear some one say,—they are, but shells, or their inhabitants,

form a principal portion of the food of many savage nations, and are eaten by civilized ones as great delicacies, and our Government Botanist, in one of his explorations, having lost his way, subsisted for several days on a species of mussel. Their structure, too, is wonderful. The specimens which we procure here more commonly are animals belonging to the *Gasteropoda*, or air-breathing shell, and are without an *operculum*, or covering to their habitation; this flat, many-whorled shell, somewhat like that of a Nautilus, is a *Planorbis*, and great care must be taken in handling it, being brittle and easily broken. The next, which is ovate, also very thin, with a large aperture, is a *Physa*, so named from its pouch-like appearance, and both genera are widely distributed throughout the world. Now watch them, how industriously they are cleaning off the film or conferva which has commenced growing on the sides of the bottle; you will observe, too, with a small pocket lens, how the tongue is used,—the upper lip with its mandible is raised, the lower lip, which is shaped like a horse-shoe, expands, the tongue is protruded and applied to the surface for an instant, and then withdrawn; its teeth glitter like glass-paper, and in *Lymnea*, an allied genus, which is also here, it is so flexible, that frequently it will catch against projecting points, and be drawn out of shape slightly as it vibrates over the surface. The large shell which you observe so frequently on the bank, and the trees which lie half in half out of the water, is a *Unio*; and from the manner in which one end is invariably broken, it is evidently brought there by some water animal which preys on its flesh—probably the water-rat. Truly, much as we admire well-kept Botanic Gardens, there is nothing which so thoroughly refreshes us as a ramble away from the conventionalities of town life, where we can breathe freely without fear of criticism; and we are inclined to think too with Headley, an agreeable writer, whose “Life in the Woods” we lately met with, that one degenerates without frequent communion with nature. “A single tree,” says he, “standing alone, and waving all day long its green crown in the summer wind, is to me more full of meaning and instruction than the crowded mart or the gorgeously built town.” Many is the happy hour we have ere now whiled away by the river side, after all our artifices had failed to lure the finny tribe into our creel, half dreamy quiet thoughts stealing over us as the stream rolled onwards, from which we were roused only by the remembrance that we had many weary miles to trudge before we could reach our destination. Happy days, indeed, on which we look back with pleasure, not unmingled with sadness,—for whose dreams are ever realized?

But to the seum which covers the surface of the water. What use is that? Ah! peep through a microscope at a small portion, and tell us what you see there: hair-like filaments of the most exquisite patterns art could produce—long tubular cells containing beautiful green spiral coils,

or numerous spherical granules or zoospores, moving restlessly about, and frequently striking against the walls of the cell, as if anxious to escape from confinement. This point gained after a while, they speedily begin to move hither and thither, now wheeling round and round, now oscillating from side to side, and now, as if from sheer fatigue, remaining quiescent. "Truly wonderful," says Hassall, in his "Fresh-water Algæ,"* "is the velocity with which these microscopic objects progress, their relative speed far surpassing that of the swiftest racehorse. After a time, however, which extends to some two or three hours, the motion becomes much retarded, and at length, after faint struggles, entirely ceases, and the Zoospores then lie as though dead: not so, nevertheless; they have merely lost the power of locomotion; the vital principle is still active within them, and they are seen to expand, to become partitioned, and if the species be of an attached kind, each Zoospore will emit from its transparent extremity two or more radicles, whereby it becomes finally and for ever fixed. Strange transition from the roving life of the animal to the fixed existence of the plant." Of these Fresh-water Algæ, we find here specimens of Chara, Conferva, Zygnema, probably many species of each. Not useless either are these minute plants, affording as they do food to so many myriads of the tiny inhabitants, and acting as purifiers to the waters in which they dwell, decomposing and removing all that is noxious, and restoring to the water oxygen, which is essential to all animal life.

We should never tire of the subject, for from the source to the Lal-lal, where the stream

"Adown the steep, with headlong leap
Plunges with roar and plashing."

And from thence to where intermingled with the Barwon it pours its waters into the ocean, there is matter enough, and we leave, even for a while with regret, the glittering Dragon-Flies fluttering over the wild plants, or darting away with the rapidity of a hawk, and feel indeed that Nature has not spread in vain her beauties over the world.

Geelong, Victoria.

NATURAL HISTORY OF NUNBURNHOLME.

BY THE REV. F. O. MORRIS.

(Continued from page 80.)

Number four. ———or, to speak more exactly—I "love to be particular," like the Vicar of Wakefield—west south-west, stands a fine Yew tree, in one of the branches of which, but at the side farthest from the

* Introduction, p. 11.

house, at a height of about four feet from the ground, a Golden-crested Wren built its nest last year, and laid several eggs. I took some out for my collection, leaving the remainder, to which she added some more, and safely hatched and reared the brood. She would allow me to go within a foot of her, and watch her sitting on the eggs or young without flying off, which she would only do if still more nearly approached.

Number five. The Blackcap.—The first appearance of this sober-clad but neat little bird this year, was on or about the 6th. of April; I am not quite sure of the exact date; it was our earliest summer visitant. It has been an unusually late and backward spring, after the equally unusually mild winter we have had. The next week there were five in the garden at once, and I have since seen the same number together. The russet brown head of the female is particularly attractive. We have had the nest twice in our garden in a bed of laurels. I think there is no bird whose song is softer than the Blackcap's.

Number six. The Willow Wren.—These little birds are plentiful with us every year, and their lively note is one of the earliest announcements we have of returning spring. The first of them I noticed the present season was on the 16th. of April. They build here and there, all about, in the orchard for instance, and in the shrubbery.

Number seven. The Lesser Whitethroat.—This species I first noticed the current year on the 19th. of April. It is another of the birds whose neatness makes up for its want of bright colours. It is common with us.

Number eight. If any bird can be described as impudent, it is the Sparrow. There are some species which appear, as it were, to have a wholly different nature from all others, as for instance the Robin. The Sparrow is another; where is there a bird at all like him? He is not only a species but a genus, in and by himself; "*sui generis*" truly, and indeed utterly unlike any and every other. I need hardly say that he is one of our most intimate associates here, but strange enough in this present year we hardly see one. There were plenty a few months ago about the house, but now they have for the most part disappeared. The common flies too, which were such a plague last year, and which this spring came forth on the first warm days from their "winter quarters" in such swarms, seem now to be extinct or nearly so, comparatively speaking. Even in the woods, where I went the other day for the first time this year, on a very hot day, to my most agreeable surprise, scarce once attacked me. I have, however, some fear that this happy state of things may not long continue.

Number nine. The Grey Wagtail.—This is perhaps the most elegant in form of our British Birds, and though no doubt they have often and often been on our premises, as I have seen them in all directions about the neighbourhood in the winter, I do not remember to have noticed but

one within the circumference, if so I may call the limits of the square I am describing; but one day on looking out of my study window, one flew up from the ground immediately beneath it. Oddly enough, this very day on which I am writing (June 28th.,) another paid a visit to our garden, and was engaged for some time picking up insects on a flower-bed, apparently for its young, which probably had been hatched somewhere not far off, by the side of the stream.

Number ten. If you were to judge of the country at large from the portion of it which our garden represents, you would unhesitatingly say that the Greenfinch was the commonest British Bird. It is positively surprising the number of nests they build with us, "here and there and everywhere;" at least it was so last year and the preceding one, but this year (1858) we have had but very few of them about; I have only noticed one nest, which was built in the top of a cypress tree about seven feet high, in which a Blackbird hatched and brought up her brood last year. In fact there are comparatively few nests of any birds in our garden this year, in comparison that is to say, with the great numbers there have been in previous seasons.

Number eleven. I generally hold a conversation with many of the birds I meet with in my walks,—Robins, Redstarts, Wagtails, Golderests, Titmice, and others, and until I made a new acquaintance, new, that is to say as to my knowledge of the name of my friend, having frequently heard a sound as of the "Woodpecker tapping the hollow beech tree." I had asked more than once "who's that knocking?" The sound was that apparently of a small Woodpecker, but I could not for some time make out who struck the blows that resounded so clearly from the tree at hand. At last I discovered the author to be the Oxeye, striking away "con amore" in and on a Yew tree, one which corresponds, near the opposite side of the house, with the one already mentioned. These trees are, I may remark "en passant," the nurseries and bed-rooms of a great portion of my large family of birds. There I heard another of these feathered smiths "hammering away" somewhere among the boughs. I walked up to see what he was about when he flitted out into a neighbouring thornbush, (mem. Thornbush,) and there he stood confessed, swaying himself up and down with all the energy imaginable; knocking his bill against the branch he was on till it made it resound again. What he was getting I cannot think, for the branch was a perfectly bare one, and it and every part of the tree thoroughly sound. No doubt, however, he had good reason for what he did.

(To be continued.)

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 135.)

BEFORE entering upon the extensive divisions of the *Noctuae* and *Geometrae*, it may be useful, for the purpose of reference, to draw up a brief resumé of those already considered, and for this reason I append the following short statement:—

RHOPALOCERA.

Omitting *C. chryseis* as not indigenous, the British species of *Rhopalocera* amount to sixty-five. Of these, forty-seven have been found in Suffolk, including *A. galathea*, on the authority of Mr. Garness. Several rarities are included in the list, viz., *V. antiopa*, *A. luthonia*, and *T. pruni*. Mr. Crewe and Mr. Bree express themselves perfectly satisfied with Mr. Garrod's statement respecting the seven *Lathonias* declared by him to have been captured by himself. It is not my place to question this statement, but I would nevertheless venture to remind them of the way in which Mr. H. Doubleday demolished the story of Mr. Seaman's alleged capture of the same insect, at the same place. (Vide "Zool," 5146.) I am disposed to question *M. athalia*. Judging by my experience of other counties, I should say that the proportion of this order occurring in Suffolk is above the average.

HETEROCERA.—Sphingidæ.

Omitting *C. nerii* and *S. pinastri* as doubtful, we have thirty-four British species. Of these, it appears, twenty-one occur in Suffolk—a large proportion, if we put aside the five extremely rare, or at least local, species of *Trochilium*. This genus seems to be but poorly represented in this county, but ample amends are made in the *Sphingidæ*, the *whole* having been taken. It seems surprising that so few of the insects in this order should be taken at sugar. Can any of my readers tell me whether they have taken them in this manner?

HETEROCERA.—Bombyces.

Omitting *L. v-nigrum* as not British, and the *Psychidæ* as not yet indisputably located, we have ninety-four indigenous species, of which Suffolk possesses sixty-nine, or rather more than two-thirds. The list contains some notabilities,

as, for example, *D. pulchella*, *L. testudo*, *N. cucullina*, *N. carmelita*, *N. dodonæa*, *N. chaonia*, *N. dictæoides*, and *C. curtula*. It seems difficult to explain the reason or reasons, why the same insect should be rare in one county, and comparatively common in another. Of course it is easy to understand why it should not occur at all in one place, though it does in another. But when it *does* occur in two counties, the food-plant or tree being equally common in both, why should it be plentiful in one, and rare in the other? Take, for example, *N. cucullina*. My indefatigable friend, Mr. Crewe, (after, I doubt not, many an hour's hard work,) found this insect in Suffolk. Its food (maple) is common enough there; and if any one would be more likely to find it than another, it would be Mr. C.; yet he only beat *two* larvæ. Now, he and I took it *commonly* in Bucks. How is this to be explained? Take, again, *N. dodonæa*. During nearly four years' residence in Gloucestershire and Bucks., I could not discover, by digging, beating, etc., more than about twelve specimens in both counties together; yet in Suffolk I took upwards of two hundred pupæ in one week! I should be very glad to receive some information or suggestions on this point. But to return. I will just give in figures the numbers alluded to above, and then for the *Noctuæ*, concerning which, however, my own personal information is comparatively limited.

British	{ Rhopalocera	65	Found in Suffolk	{ 47
	{ Sphingidæ	34		{ 21
	{ Bombyces	94		{ 69
<hr/>			<hr/>	
193			137	

PART II.—HETEROCERA.

DIVISION III.—NOCTUÆ.

THE arrangement of M. Guenée is followed in this list.

1. *T. derasa*.—Not uncommon at sugar at Brandeston. Larva twice beaten from *hawthorn*, but not bred. It is a very shy insect.

N.B.—Some years ago I used to take this insect in my grounds at sugar, but I have not met with it at all during the last three or four years. I have bred it from larvæ found on hazel. (B.)

I have taken the pretty fulvous-white spotted larva of this insect upon *bramble* as late as the first week in November. The perfect insect appeared May 21st. I have no doubt that it is double-brooded, as I have taken the moth throughout the month of August. (C.)

2. *T. batis*.—Rarer than the preceding, though occasionally taken at sugar. I used to meet with the larvæ in profusion in Bucks, feeding upon brambles, in the dense portions of the woods surrounding my house, but it seems very subject to ichneumons. The chrysalis is very singular in its appearance, and is enclosed in a weak web.

N.B.—Taken, but not commonly, at sugar in the woods round Stowmarket. (B.)

As shy at sugar as its congener. It never seems to get intoxicated, and no matter how potent the liquor, or how protracted the bout, it bolts off with the utmost activity upon the approach of the lantern and pill-box. I have taken the larva several times upon *raspberry*. (C.)

3. *C. duplaris*.—Once or twice beaten from oaks, in the neighbourhood of the Duke of Hamilton's park at Easton.

N.B.—This insect is common in the woods near Stowmarket. (B.)

I have very frequently bred this insect from larvæ beaten in September and October, off *birch* and *hazel*. It is a dusky olive colour on the back, with a yellow head, and is semi-transparent. It so closely resembles the larva of a *Tenthredo*, that for a year or two I used always to throw it away when I beat it, under the idea that it was one of "those vile saw-flies." (C.)

4. *C. diluta*.—I have taken this insect in the woods near Stowmarket, both the larva and imago. (B.)

The larva of this insect is pale green, with a brown head, very similar to that of *C. diffinis*. It is full-fed the beginning of June, and feeds on oak. (C.)

5. *C. or.*—I did not meet with this species, and I only mention it for the purpose of saying, that I think the larva prefers aspen to poplar, the food given in Stainton's "Manual."

N.B.—Not uncommon in the woods near Stowmarket. (B.)

The singular, flat-headed, depressed-looking larva of this insect, is not at all uncommon in August, on *aspen*, in the woods round Ipswich and Stowmarket. It spins two leaves together, where it lives, only coming out to feed. When full-fed it constructs a slight earthen cocoon, similar to that of *C. ridens*. It is so transparent that its intestinal arrangement is plainly visible. When young it so closely resembles the larva of *D. fagella*, that any tyro might easily confound them, especially as they occur at the same time. I have beaten it in Herts. as late as the end of October. I have once or twice taken it upon the Lombardy poplar; but, as Mr. Greene remarks, aspen is undoubtedly its favourite food. The pupa is almost precisely similar to that of *C. ocularis*, but not so robust. The moth is very shy at sugar, and requires nimble fingers to box. (C.)

6. *C. ocularis*.—Considering the almost universal rarity of this beautiful insect, I may consider myself fortunate in having bred nine splendid specimens, all taken by digging. The larva is well described in the "Manual," but I should decidedly give *poplar* as its food, though it may very possibly feed on aspen also, though I never met with it on that tree. All my pupæ were taken at the roots of what is called, I believe, the Lombardy poplar. Like most, if not all the species in this genus, the larva spins two leaves close together, and resides between them during the day-time, coming out to feed during the night. It is almost useless, therefore, to look for it by beating. By looking at the leaves against the sky, it may sometimes be detected, (if there at all,) and should there be any shrubs scattered about, all the leaves glued together should be carefully opened and examined. It is also well worthy of notice, that the little bits of decayed leaves hanging curled up on the stalks are favourite hiding or resting-places with the larva of this and the allied species. They should therefore not be omitted by the tyro anxious to see this fine insect in his collection. The perfect insect seems fond of sugar, (I have taken it twice,) but is very shy and timid.

N.B.—I bred a specimen of this insect, June 8th., 1857, from a pupa found

under the moss on an old poplar. At sugar I took one, June 19th., 1856. Another June 22nd., 1857. It was looked for assiduously during the June of this year without success, I never found the larva. I look upon it as one of the rarest of the British *Noctuæ*. (B.)

The only specimen I possess, a splendid female, was bred, June 13th., from a pupa which I dug up under loose bark at the foot of a large old English poplar. My friend Mr. Bree also found his pupa on this tree. (C.)

7. *C. flavicornis*.—Larva occasionally on birch. Mr. Chapman, of Glasgow, informs me that he takes it in September, and, knowing his accuracy, I am fully satisfied of the correctness of this assertion. As far, however, as my own experience goes, I can only reiterate my former statement, that I never took it later than the end of June. I cannot think that it is found in England much after that period, and I believe there is no doubt but that there is only one brood of this and the following species. It is said to come to sugar, but I have not met with it.

N.B.—I have no hesitation whatever in concurring with my friend Mr. Greene in thinking that this larva (at any rate in England) is never found later than July. It is by no means uncommon in some parts of Derbyshire upon birch. I have never beaten it later than the middle of July, and then only an occasional straggler. The majority are full-fed by the end of June. It is pale green, semi-transparent, with a reddish head, and black spiracular spots. It lives between leaves like the larva of *C. or.* The pupa resembles that of *C. ridens*. It is enclosed in a slight cocoon, under moss or amongst the roots of grass at the foot of the tree. I never took the perfect insect. (C.)

8. *C. ridens*.—I was also fortunate in finding a considerable number of the pupæ of this insect at Brandeston. It was, however, very local. In my paper on pupa digging I have given directions for finding it, and I need not occupy space by repeating them here. It was much rarer at Playford. The specimens taken in Suffolk are far more richly-coloured than any I have seen captured in the north. Not having myself met with the larva, it may seem somewhat presumptuous for me to express my firm conviction that the period (September) given by Mr. Stainton, in the "Manual," is wholly incorrect. I can only say that I always found the pupa from a month to five weeks *before* that date. It strikes me that Mr. S. has fallen into the error (not unnatural, perhaps, if he never met with the insect himself) of *supposing*, that as the insect appeared in the spring, the larva had *probably* fed up the preceding autumn. But supposition and probabilities will not do in these matters.

N.B.—I found a single larva of this insect July 10th., 1857, which I bred in May, 1858. It was feeding upon oak. (B.)

The beautiful larva of this still more beautiful insect, is of a bright primrose yellow, minutely spotted with white; the head is reddish. It feeds, I believe, exclusively on oak. It is full-fed about the last week in June. From June 22nd. to 30th. this year, 1858, a friend and myself beat six or seven just ready to spin up. It is very liable to ichneumons. The pupa is

red, and sharply pointed. Mr. Stainton certainly made a slip of the pen when he gave September as the month for finding the larva. (C.)

9. *B. perla*.—This insect is taken, but not commonly, in the neighbourhood of Stowmarket. (B.)

(To be continued.)

Rare Lepidoptera.—The last two or three years have been distinguished by the re-appearance of rare species of British Lepidoptera. *Agrotis lunigera* and *lucerna*, *Heliophobus hispida*, *Crimodes templi*, *Petasia nubeculosa*, *Phlogophora empyrea*, and *Noctua ditrapezium*, have all been found, and some of them in considerable numbers, by the indefatigable perseverance of our collectors. We believe that others are known, though not generally, in consequence of the precaution rendered absolutely necessary, of not publishing the localities of rare species, by the wholesale extermination system of those who advertise for insects by the gross. Thus we have very good reason for believing that *C. dispar* is not extinct. *Limacodes asellus* was taken last year by hundreds. Mr. Battersby found that beautiful insect *Acontia luctuosa* both last year and this, in considerable numbers, and we reported in our last, his capture of several specimens of *Micra Ostrina*, an insect only known to have occurred once before in England, and that single specimen at Bideford, in 1825. In our last number, Mr. Dorville recorded the capture of *D. Livornica*. All this proves that entomology is progressing in this country; for the discovery of rare insects (though isolated cases may be accidental) in a multiplicity of species, shows increased diligence and interest in the science on the part of our collectors. It is worthy of note also, that these discoveries, not only among the Lepidoptera, but other families in Entomology have been made by the hard-working collector who studies in the fields and woods.—Ed.

Double-broodedness of the Notodontidæ.—Is it not probable that further light will be thrown on the question of the Double-broodedness of the *Notodontidæ* until additional facts are supplied; and certainly the advocates of the *annual* development only, have offered little else than opinions. I secured a supply of fertilized eggs of both *N. dictæa* and *P. palpina*, amply sufficient to enable me to breed the insects both in the "normal" and "abnormal" state; the young larvæ are feeding well, and I hope to be able in some measure to supply the want. I find the casualties in the natural state very great, especially while the larvæ are young. Mr. Chapman, of Glasgow, privately remarks that it is not a matter of much moment, whether certain insects are single or double-brooded, and I agree with him; but it is most interesting to know, whether being taken from their native haunts and bred in confinement, as it is termed, will produce such a remarkable change in their economy. Had Mr. Greene produced facts in support of his assertion that this change does take place, it would have added to our knowledge; but mounting his hobby "abnormal," he charges all who think otherwise, without offering a fact in return. Will he draw the rein for a moment, and explain to us how it is that, while according to his theory the *Notodontidæ* are so readily affected,

yet no amount of coaxing, forcing, or cooking has any influence on such insects as *C. Jacobæ*, *O. pudibunda*, *I. Monacha*, *E. lanestræ*, *D. cæruleocephala*, and a host of others which we know to be single-brooded in a normal state? As Mr. Greene himself says, I pause for a reply. The failure on the part of the advocates of single-broodedness to produce facts, has not been without its moral advantages; it has caused a searching into insect life by young and old; the mind has been elevated from the miserable acquisitive desire to possess and accumulate specimens, to the study of nature herself, and it is pleasing to know and learn, that many fair friends and companions have eagerly joined in this research, sharing a fount of pure pleasure. These "incipients" are astonished to find how little they knew, and, like ourselves, yet know, of the wonders of nature in general, and of insect life in particular, and how imperfectly they have hitherto understood how heartfelt were the expressions of the sacred writer, "Oh Lord, how manifold are Thy works! in wisdom hast Thou made them all: the earth is full of Thy riches." "He hath established them for ever: He hath given them a law which shall not be broken." "Whoso is wise will ponder these things."

Speaking of the rapid growth of larvæ, I had eggs of *P. palpina* hatched June 8th., larvæ spun 27th., namely, nineteen days. They really fed only eighteen days.—G. GASCOYNE, Newark, June 19th., 1858.

Nomenclature of Insects.—With reference to the reply given to my quære in the June number, by Mr. Bree, I was already aware of, and possess most of the lists enumerated, but I was in hope to have heard either that there is, or is likely soon to be published, a "full and complete" catalogue of the whole of the British insects, if not of the foreign, as far as may be. At least we are all, as I said, at sixes and sevens. The British Museum lists are exceedingly well done in themselves, but inasmuch as they only contain the names of the species possessed by the museum, they are completely useless for any other collection, for almost hopeless as it may be for any private person to look for so large a collection as that possessed by the National Museum, every one hopes to have every species, and if he has arranged only for a complete number, every addition finds the space for it already pre-occupied. Besides all which, the British Museum lists are in much too large a sized print, so that they not only do not look well in themselves, but mar the uniformity which there ought to be in a cabinet, if arranged partly by them and partly with any other lists, (always in much smaller type,) Dawson and Clark's for instance. Dawson and Clark's list, mentioned by Mr. Bree, is excellent as far as it goes; I only wish that it contained the whole of the Coleoptera. So is Stainton's list of the *Tineina*. Doubleday's new edition of the Lepidoptera will also, I have no doubt, be as good as the former one was at the time. But what is wanted is a new "Stephens" or "Curtis." Of course I do not mean a reprint of their old editions, but a list on the plan of theirs, comprising the whole of British entomology. I think such a catalogue would pay, especially if printed with a wider margin against each column for notes, dates, etc., even perhaps to the extent of there being only one printed column on each page.—F. O. MORRIS, Nunburnholme Rectory, July 2nd., 1858.

[If Mr. Morris will examine his museum lists, he will find they are complete lists either of British insects or the entire families. The letters B. M. are placed at the end of those species in the national collection. However desirable it may be to have a complete list of Insects, I sincerely hope that no attempt will be made to publish a work of the kind hastily. *It cannot be done by one man*, and surely the best way to attain such an object is to wait until the *workers*, in their several departments, have thoroughly investigated their branches of the science. What Waterhouse, Clark, Dawson, and Walker, have done for the Coleoptera in the last, I may say, few months, there is not much doubt will be effected in the other orders in due time.—ED.]

Arctia caja.—In the February number, Mr. Greene speaks of this insect as being rarely met with in the imago state, in his part of the country, but the contrary has been my experience in other districts. I have on different occasions taken it on the wing, and have repeatedly met with it during the day-time lying *perdu*; most commonly in strawberry-beds, when the fruit is ripe, to which the colour of the under wings of the moth much assimilates. A short time ago when shewing my collection to two of our national school boys, one of them instantly pointed to the row of large Tigers, and remarked of them that they were common.—F. O. MORRIS, Nunburnholme Rectory, June 26th., 1858.

A Curious Fact in Entomology.—The schoolmaster of this village, who I am happy to say has, as well as a son of the person with whom he lodges, become imbued with a love of Entomology, originally, I fancy, from one of Stainton's "Educational Sheet of Butterflies," I had put up in the school, went out nothing last week to our wood, and at or after nine o'clock at night, took a fine specimen of *Thecla W-album*, at his sugar on a tree.—Idem.

Acidalia Blomeraria.—In the month of June the Rev. R. P. Alington, who was staying the week with me, took a fine specimen of this moth, "just out," in our Bront Wood—a new locality; but it has, I believe, been already taken in Yorkshire, namely, at Howsham Wood, by my friend the Rev. G. R. Read. When first seen it was perched on the trunk of a large yew tree, but flew off and was captured. I have looked for others since, but without success.—Idem.

Capture of Sphinx convolvuli.—I had the good fortune to have brought to me, on Saturday, July 10th., a magnificent specimen of *S. convolvuli*, a male, taken in a garden resting on a piece of wood. I have also taken, during the last fortnight, on the wing, off one honeysuckle, between nine and half-past nine o'clock, fine specimens of the following:—*S. ligustri*, seven; *C. elpenor*, one female and four males; *C. porcellus*, one male; *M. stellatarum*, seven males and one female.—ARTHUR L. SIMPSON, Stowmarket, July 12th., 1858.

Cucullia chamomillæ.—A larva of this insect was taken by Mr. Joseph King, in a field near this town on the 11th. instant, feeding on the Wild

Chamomile, (*Matricaria chamomilla*.) We believe this is the first instance of this insect being taken in the county of Suffolk.—ED., Stowmarket, July 12th., 1858.

Odynerus parietina.—At the beginning of June, 1857, as one of my daughters was sitting at work one morning at the open window, a female of this mason wasp flew in, carrying a lump of moist clay in its mouth. It proceeded to enter a cotton-spool which was lying on the table, and having remained a few minutes re-appeared minus the clay, and flew out of the window. It soon, however, returned, laden as before, and was going to re-enter the spool, when my daughter caught it, took away the clay, and threw it out of the window, which she closed. The following morning, however, at the same hour, the wasp again appeared with her lump of clay, and made her way as speedily as possible into the spool. She was now allowed to pursue her labours unmolested, and set to work at once to construct a cell. Having deposited an egg, and filled the cell up with benumbed caterpillars, she proceeded to make another in a precisely similar manner. The spool just held three cells. She then neatly closed the spool up, and took her final departure. At the beginning of June of the present year, 1858, three wasps, two males and one female, made their appearance out of the spool, at an interval of two days each. I kept the female several days, and fed her upon moist sugar, which she appeared to relish. From ten o'clock, a.m., to four o'clock, p.m., she was very lively; but at four, p.m., she regularly turned into the spool, where she remained till the following morning.—W. BAKER, Battisford, Suffolk, July 12th., 1858.

Colias edusa.—On June 3rd. my son saw a fine specimen of this insect at Battisford, but was unable to catch it.—Idem.

A. atropos.—On June 20th., a fine specimen of this *Sphinx* was taken on some pea-sticks at Battisford and brought to me.—Idem.

S. convolvuli.—On July 3rd., a female of this insect was taken in a cottage garden at Battisford, and carried to Mr. W. Baker, of that place, an entomologist of long standing. He strapped it alive on his setting-board, where it soon began to lay eggs. By Sunday night it had deposited between fifty and sixty eggs; it then died. Mr. Baker has most kindly presented the eggs to me. They are not yet hatched, but will soon, I hope, produce a goodly brood of young *Convolvuli*. In size, colour, and appearance, they so closely resemble the eggs of *C. vinula*, that, had I not known to the contrary, I should have supposed them to be laid by that insect.—H. H. CREWE, July 12th., 1858.

Bee Taming.—On Wednesday a swarm of Bees from a neighbouring apiary, settled upon the window of a shop in one of the leading thoroughfares in Morpeth, and by the attention which they excited, threatened to cause some obstruction to business in that part of the town. The master of the shop, however, who possessed some knowledge of Bees, in the

course of a very short time had the entire swarm rendered perfectly quiet and manageable by the application of chloroform. Having by this ingenious device been made completely harmless, they were carefully parcelled up and delivered to the owners. It may not be generally known that by the application of chloroform, Bees may be rendered innocuous, and while in this state, that the honey may be taken from them—a process which, it must be allowed, is much less revolting than the common practice of destroying them altogether.—*Northern Daily Express*.

[Having been for some years a subscriber interested in "The Naturalist," I send the above for insertion, hoping that some of your readers may be able to inform the public how the application of chloroform should be made to be effective, and thus save the lives of thousands of these most interesting and useful insects.—ISAAC HARTAS, Wrelton Hall, Pickering, Yorkshire, June 26th., 1858.]

LIST OF SHELLS
FOUND IN THE NEIGHBOURHOOD OF WATERFORD.

BY MR. J. FAYLE.

- Cyclas cornea*.—Common.
C. lacustris.—Ballynakill, Newport's Pond.
Pisidium pulchellum.—Common.
P. nitidum.—Rare.
P. amnicum.—Kilmacow.
Unio margaritiferus.—Kilmacow.
Paludina stagnorum.—Ballynakill.
Bithynia tentaculata.—Common.
Valvata piscinalis.—Mill Pond at Kilbarry. Rare.
V. cristata.—By the Cork road. Rare.
Arion hortensis.—Common.
A. atur.—Common.
Limax agrestis.—Common.
L. arborum.—Common.
L. flavus.—Common.
Vitрина pellucida.—Pretty common.
Zonites cellarius.—Common.
Z. alarius.—Not common. Cromwell's Rock, Billinamona.
Z. nitidulus.—Common.
Z. purus.—Gall's Rock, Snow Hill. Not common.
Z. radiatulus.—Common.
Z. nitidus.—Rare.

- Z. excavatus*.—Rare. Snow Hill, Ballygunner.
Z. crystallinus.—Common.
Helix aspersa.—Very common.
H. nemoralis.—Common.
H. virgata.—Common. Woodstown, Tramore.
H. caperata.—Common.
H. ericetorum.—Common. Tramore, Woodstown.
H. rufescens.—Common.
H. hispida.—Common.
H. concinna.—Common.
H. aculeata.—Not common. Tramore, Ballygunner.
H. fulva.—Pretty common.
H. pulchella.—Newtown. Common.
H. rotundata.—Common.
H. umbilicata.—Common.
H. pygmæa.—Rare. Ballygunner.
Bulimus acutus.—Very common at Tramore.
Pupa umbilicatus.—Common.
P. museorum.—Tramore, Woodstown.
P. Anglica.—Common at Tramore near the Metal Man; also at Ballygunner, and near the Ferry.
P. edentula.—Rare.
P. pygmæa.—Common. Newtown Estate.
P. substriata.—Ballygunner, Tramore. Rare.
P. antivertigo.—With *P. Anglica*.
P. pusilla.—Tramore, Woodstown. Rare.
Balea fragilis.—Common.
Clausilia nigricans.—Common.
Zua lubrica.—Common.
Achatina acicula.—Rare. Newtown estate.
Succinea putris.—Common. Kilmacow, Kilbarry.
S. putris, var. *gracilis*.—Common.
Physa fontinalis.—Common.
P. hypnorum.—Common.
Planorbis albus.—Newport's Pond, Kilbarry.
P. nautilus.—Newport's Pond. Common.
P. marginatus.—Common.
P. vortex.—Common.
P. contortus.—Common.
P. nitidus.—Common.
Linneus pereger.—Common.
L. pereger, var. *lineata*.—Newport's Pond.

L. pereger, var. *acutus*.—Newport's Pond.

L. stagnalis.—Kilmacow. Rare.

L. truncatulus.—Common.

L. glaber.—Common.

L. palustris.—Common.

Ancylus fluviatilis.—Common.

Conovulus denticulatus.—Common.

Carychium minimum.—Common.

Newtown School, Waterford, 24, 5 Month, 1858.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 167.)

Halmaturus dorsalis, *Schinz.* *Macropus dorsalis*, *Gray.* *Water.*

Halmaturus Eugenii, *Schinz.* *H. Thetidis*, *Geoff.* *Kangurus Eugenii*, *Desm.*

Halmaturus Derbyanus, *Gray.* *Schinz.*

Halmaturus brachyurus, *Schinz.* *Kangurus brachyurus*, *Quoy et Gaimard.*

Halmaturus fasciatus, *Peron.* *Schinz.* *H. elegans*, *Cuv.*

Halmaturus penicillatus, *Schinz.* *Petrogale penicillata*, *Griff.*

Halmaturus robustus, *Schinz.* *Macropus robustus*, *Gould.* *Petrogale robustus*, *Gray.*

Halmaturus albogularis, *Schinz.* *Heteropus albogularis*, *Jourdan.*

Halmaturus brachyotis, *Schinz.* *Petrogale brachyotis*, *Gould.* *Water.*

Halmaturus agilis, *Gould.* *Schinz.*

Halmaturus conspicillatus, *Schinz.* *Lagorchestes conspicillatus*, *Gould.*

Halmaturus antilopinus, *Schinz.* *Osphranter antilopinus*, *Gould.*

Halmaturus Isabellinus, *Schinz.* *Osphranter Isabellinus*, *Gould.*

Halmaturus Binoc, *Gould.* *Schinz.*

Halmaturus concinnus, *Schinz.* *Petrogale concinna*, *Gould.*

Halmaturus inornatus, *Schinz.* *Petrogale inornata*, *Gould.*

Halmaturus melanops, *Schinz.* *Macropus melanops*, *Gould.*

PHASCOLOMYS.

Phascolomys Wombat, *Schinz.* *P.*

Wombatus, *Leach.* *P. fuscus*, *Desm.*

P. Bassii, *Less.* *Didelphis ursina*,

Shaw. *Wombatus fossor*, *Geoff.*

Fisch. *Waterh.*

ORDO VI.—GLIRES.

FAMILIA I.—PEDIMANA.

CHEIROMYS.

Cheiomys madagascariensis, *Schinz.*

Sciurus madagascariensis, *Linn.* *Lemur psilodactylus*, *Schreb.*

FAMILIA II.—SCIURINA.

SCIURUS.

Sciurus vulgaris, *Schreb.* *Schinz.*

Sciurus alpinus, *Desm.* *Less.* *Schinz.*

Sciurus italicus, *Bonap.* *Schinz.*

Sciurus capistratus, <i>Ross. Schinz.</i> S.	Sciurus fuliginosus, <i>Bach. Schinz.</i>
vulpinus, <i>Gmel. Linn.</i> S. niger,	Sciurus Bottæ, <i>Less. Schinz.</i>
<i>Catesby.</i> S. variegatus, <i>Schreb.</i>	Sciurus Douglasii, <i>Gray. Schinz.</i>
Sciurus rufiventer, <i>Schinz.</i> S. suban-	Sciurus lanuginosus, <i>Towns. Schinz.</i>
ratus, <i>Bachm.</i>	Sciurus magnicaudatus, <i>Harl. Schinz.</i>
Sciurus aureogaster, <i>Fr. Cuv. Schinz.</i>	S. macrourus, <i>Say. Gadman.</i>
Sciurus cinereus, <i>Schinz.</i> S. virginia-	Sciurus Audubonii, <i>Bachm. Schinz.</i>
nus, <i>Bris.</i> S. carolinensis, <i>Linn.</i>	Sciurus Hudsonius, <i>Pall. Schreb. Fr.</i>
Sciurus leucotis, <i>Gapp. Schinz.</i>	<i>Cuv. Geoff. Desm. Gapp. Richard.</i>
Sciurus carolinensis, <i>Schinz.</i>	<i>Bachm. Schinz.</i>
Sciurus niger, <i>Linn. Schinz.</i>	Sciurus Lewisii, <i>Griff. Schinz.</i>

(To be continued.)

Miscellaneous Notices.

Remarkable Longevity of a Goose.—A very striking instance of the length of life enjoyed by Geese has just come to our knowledge. A Goose in the possession of Mr. Bayley, of Norton, near Wroxeter, in this county, died on Saturday, the 5th. inst., at the great age of forty-three years. The same Goose this year laid nine single and one double-yolk eggs. We are not aware of a similar instance of a Goose living for so long a period. —*Shrewsbury Chronicle*, June 18th., 1858.

A Tom Tit's Whim.—The week before last our Whitechurch correspondent gave an interesting account of a Golden-crested Wren having built her nest in the throat of a dead calf, at Marbury; this week our Ellesmere correspondent has furnished us with the following extraordinary fact:—"In a pump at the residence of Mr. Roe, surgeon, of Ellesmere, may be seen the nest of a Tom Tit about half a yard from the top, containing ten young birds. It is securely fastened round the orifice of the pump tree, but strange to say, the bucket passes through the centre of the nest. The young ones appear to be much alarmed when the piston moves, (which of course it is very frequently doing,) and they scuffle away from it as fast as they possibly can. How the old bird sat her eggs is a mystery, as they must of necessity have been disturbed occasionally around the iron rod when the pump was at work."—*Shrewsbury Chronicle*, June 18th., 1858.

Proceedings of Societies.

East Kent Natural History Society.—(Continued from page 172.)—But the charm of Natural History does not consist alone in collecting speci-

mens. It is said by some to be a cruel science, leading to a constant destruction of life. As far as the true naturalist is concerned, this is a most unjust accusation. He seeks for specimens to study their form, colour, and internal anatomy for purposes of comparison. But with him there is no wanton destruction of life—no sportsman's thirst for spoils. With his knowledge of structural form, come higher and nobler views, and he now endeavours to make himself conversant with their habits and social relations.

Few things are more striking than the migration of birds; yet how little correct information do we possess on this subject. We watch the swallow come and go; but what spirit guides it on its trackless journey?

Is it not wonderful to see the variety of little fragile summer birds—which, from their extremely delicate frames, seem as if a gust of wind would waft them to destruction—coming to build almost within a day of their expected time; and to think how hard their little pinions must work from the time they leave land, till they again set foot upon it.

In this country we have summer visitors, winter visitors, and residents. Those which come to us in the spring, arrive for the purposes of breeding; those which appear in winter, come for food—such as the fieldfare, redwing, snipe, etc., and a few of the latter doubtless breed here, the bulk of them repair to Norway and Sweden for the purposes of incubation. Why the fieldfare and redwing leave us for a northern summer, when others of the same family remain all the year round—such as the common thrush, the missel thrush, the blackbird, etc.,—we know not. These are subjects of great interest to the naturalist, and it is only by accurate notes that the mysteries of migration will ultimately be unravelled.

The joyous little harbingers of spring have now arrived, all clothed in their brightest plumage, full of energy and life, redolent in song and in happiness, greeting, as it were, with their vocal music, the native islanders upon whose domains they come to pass the summer months. The great business of their transient lives is now called forth—the continuance of their race.

The birds having paired, suitable places are selected for building their nests; and here, how singularly the habit of the bird is shewn. In the places chosen, the shy and timid, the bold and confident, have marked peculiarities.

The grasshopper warbler builds her nest so as almost to escape detection. Mr. Yarrell remarks, that, “unless the old birds are closely watched, and seen carrying materials for building, or food for the young, the nest is very difficult to find.” He mentions one discovered by Mr. R. Wingate, of Newcastle-upon-Tyne, who watched the bird to the distant passage on

the top of a whinbush, by which it entered and left the nest, which was built at the bottom of a deep and narrow furrow, or ditch, overhung by the prickly branches of the bush, and grown over by the thick coarse grass, matted together year after year, to the height of about two feet, all of which he was obliged to clear away piecemeal, before he succeeded in gaining the prize. The nest was composed of coarse, dried grass, and contained five beautifully white eggs, closely freckled with carnation spots.

The martin and swallow seek the humble roof of the poor cottager; here they are almost always protected, and repay with their happy twitterings, the shelter thus given to them.

A curious anecdote of a martin was related to me. It appears that a poor boy had met with an accident and broke his leg. The room in which the sufferer lay being small and heated, the upper part of the window was let down. A martin soon entered; it flew in and out again several times, and finding itself unmolested commenced building against the ceiling. This the birds were allowed to do. The eggs were laid, then hatched, and in due time the young brood took wing. Both the martin and swallow return frequently, if not always, to the same neighbourhood.

A pair of chaffinches, during the last summer, built their nest in the spreading branch of a fir tree in my garden, about four feet from the ground. I watched the parents at a distance, about their task; it was soon finished, and eggs deposited. During the incubation, I went frequently during the day to see the patient little bird sitting on the nest, and would stand within a foot of her. When I found her off, I would scatter crumbs of stale cake round the nest; and as soon as the young birds were hatched, I became more familiar, and both the old and young birds would feed from my hand. Having several workmen about the place, I was pleased to see the interest they took in the novel sight. The old bird at their approach merely left the nest and remained within two or three feet of it, seeming to have lost nearly all fear of danger.

Alas! The fate of my poor little pets was sad indeed. On Sunday morning, the 7th. of June, I went after church, as usual, to feed them, when to my horror I saw the nest torn down, and the feathers of both old and young birds strewed upon the ground. The tale is soon told. A stray cat had unfortunately discovered the nest, and must have reached it easily by springing from the ground.

Some of the birds' nests are exquisite specimens of workmanship. The chaffinch, wren, and long-tailed tit are most neatly and beautifully constructed. Other birds have scarcely any nest, and the night-jar merely deposits her eggs in a small cavity of the bare ground, by the side of brushwood, and then hatches them.

It is during this process that most of our song-birds are in best voice.

“‘Tis sweet to be awakened by the lark,
Or lull’d by falling waters. Sweet the hum
Of bees, the voice of girls, the song of birds,
The lisp of children, and their earliest words.”

It is at this time of the year that the ornithologist takes his sylvan rambles with the greatest delight. The woods, the hedgerows, and the fields are alive with song. And as he strolls along, what a pleasure it is to him to recognise by their voices the different warblers of the feathered race. But there is a charm even beyond this.

Birds have great perceptive qualities; they are easily taught and trained, and love the hand that fosters them. Those who have had much insight into the habits of birds, are aware that their tempers vary even as our own. Some have larger capabilities for learning than others.

I doubt not, many present have witnessed the exhibition of canaries in the open streets. A deserter is tried, condemned and shot; a canary pulls the trigger, the prisoner falls dead—but in imitation only, for at the word of command it starts up, and flies to the finger of its patron.

(To be continued.)

The Shropshire and North Wales Naturalists' Field Club.—The members of this Society held its first excursion for this season yesterday week, in the neighbourhood of the far-famed “Pistyll Rhaiadr,” about four miles from Llanrhaiadr, when the following gentlemen were present:—The Rev. W. W. How, vice-president; Rev. J. O. Phillips; Rev. D. P. Lewis; Rev. F. W. Parker; Rev. D. Lloyd; Rev. Henry Jones; Rev. D. Evans; and Rev. J. C. Hill; Mr. C. E. Parker; Mr. Roberts; Mr. W. Wilding; Mr. D. C. Davies; Mr. E. W. Thomas; Mr. T. Vaughan; Mr. A. E. Evans; Mr. Lees; Mr. Gwyther; etc.; who afterwards dined together at the Wynnstay Arms, Llanrhaiadr; the Rev. W. W. How, of Whellington, in the chair. The second excursion is fixed for the Breidden-hill, and the third for Llangollen. —*Shrewsbury Chronicle*, June 18th., 1858.

The Retrospect.

WITH reference to Mr. Fuller's just observations upon my error of latitude and longitude, all I remember is that I gleaned, a long time ago, a large mass of statistics from various sources, and *think that* fact was from a topographical work, which I must have copied mechanically. It is manifestly too erroneous, I hope, to mislead any one; if it did, I fear they would not find Sunninghill!—O. S. ROUNO, 19, Richmond Terrace, Westbourne Grove, North, July 3rd., 1858.



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No. 91.

SEPTEMBER, 1858.

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THE ENTOMOLOGICAL DEPARTMENT

BY C. R. BREE, ESQ.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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Communications have been received by the Rev. F. O. MORRIS, from Messrs. J. HARTAS;—DR. HOBSON;—E. J. MAUDE;—T. FULLER;—O. S. ROUND;—REV. J. DALTON;—J. G. BAKER;—ALPIN GRANT;—W. B. WOOD.

The above were unfortunately not sent to the printer's in time to be inserted on the cover of the August Number.

Further Communications have been since received from Messrs. "WILLIE;"—W. V. GUISE;—E. J. MAUDE;—T. G. HAWKE;—J. G. BAKER.

Communications, Drawings, Books for Review, and Parcels, to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York.

Advertisements to be forwarded to Messrs. GROOMBRIDGE & SONS, 5, Paternoster Row, London.

ENTOMOLOGY.

Communications have been received by C. R. BREE, from The Rev. J. GREENE;—REV. H. H. CREWE;—MR. SIMPSON;—MR. UNWIN.

* * * In consequence of Mr. Bree's change of residence, all communications for the Entomological department of "The Naturalist," must be addressed after August 14th., next, until further notice, to MR. FAWCETT, *East Lodge, Driffield.*

ERRATA IN No. 90.—Page 187, for 'completely useless' read 'comparatively useless;' and for 'a complete number' read 'an incomplete number.' Page 188, for 'Bront Wood' read 'Brant Wood.'

TO ADVERTISERS.

Advertisements are inserted on the Cover of THE NATURALIST, on the following Terms:— $\frac{1}{2}$ of a page, 4s.— $\frac{1}{4}$ of a page, 7s.— $\frac{1}{2}$ of a page, 12s.—Whole page, 21s. Bills stitched in, 20s.

Advertisements to be sent in not later than the 15th. of the Month.

NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

(Continued from page 153.)

CHAPTER IV.



TOWER HILL, forming, as I have said, a point in the landscape, the ground beyond it falls into a number of transverse undulations, but still at a considerable average height above the surrounding country, extending due south-west as far as Bagshot Park—many years the residence of William, Duke of Gloucester, and afterwards of his widow, who in turn left it from increasing age and infirmities; and it was then inhabited by Colonel Seymour for some time, and is now, I believe, vacant. Behind this Park a lofty ridge of heath-hills run towards the south for many miles, another turns at right angles to these, and proceeds due east from the parish of Windlesham, as far as Broomhall, where a monastery of Benedictine Friars stood previously to the Reformation, the site being marked by some ancient yew trees and the marks of a large kitchen,—a never-failing concomitant of religious houses of the previous era. This site is now occupied by a farm-yard and home-stead. The hills then rise considerably to the east, and are clothed with wood, and partly occupied by a small colony of houses, in which cottage and genteel residences are intermixed.

At the foot of these hills, which form the northern boundary of the county of Surrey, runs the Great Western Road, already mentioned; and the high ground at the summit of the ridge eastward, again at right angles, turns due north by Virginia Water and Windsor Great Park, and extends as a sort of distant amphitheatre to Ascot Heath again; and thus, if my readers have had patience to follow me, we come round again to the point from whence we set out. Between Ascot Heath and Hagthorn is the highest point in this district, known as Bol-marsh or Bol-ridge Hill, (I am not certain of the spelling,) probably from the prominent part it takes in the scenery.

The whole of this country bears indubitable marks of having been, probably at the time of the first invasion, a stronghold and encampment of the Romans. Numberless evidences have been discovered of their presence, such as coins, urns, rings, spears, and various kinds of pottery; and one place, called "Wickham Bushes," is covered with barrows, which have almost all been opened, and found to contain the articles above mentioned, and in some instances, human bones. As these mounds were no doubt the mausoleums of this people, we can only refer the circumstance of human remains not being often discovered to the fact of their decay,

which in a very few years returns our bodies to their parent dust, even with all the means that are so studiously taken in this enlightened age, to preserve them, and surely how much more where a mere earthen vase was their only receptacle. For a minute description of these antiquities I refer the curious reader to a work called the "Nerva Britannica," which was published some years since, especially devoted to illustrate and describe these discoveries. Setting this aside, the remains of Roman encampments which are still so obvious in all parts of England, are particularly perceptible here; and no one, on mounting any of the hills which command a view of these evidences, can doubt for a moment that they are not the effect of chance, or of any convulsion of nature, but that they were formed by human art, and for military purposes: indeed this part is known as "Caesar's Camp," and the road leading from it, as the "Old Roman Road," and so marked in the maps.

Most of the lower parts of these valleys are more or less marshy, and contain some excellent snipe-grounds, a friend of mine, (now, poor fellow, numbered with the dead,) having killed thirty-seven on one Michaelmas Day, in a few hours; but he was a first-rate shot, and happened (as he thought) to light upon a flock, inasmuch as the great proportion were "Jacks." The nature of the soil varies a good deal here, but the change is invariably marked by the different nature of the herbage. It may be laid down, indeed, as a safe rule, that grass will scarcely ever grow on white sand, or heath on loam. All the higher grounds are hence heathy, the hills being generally composed of gravel; but there is a peculiarity in this production, for whilst all the centre rising grounds and those to the south supply the very best *red* gravel, those to the west and north-west yield almost wholly circular pebbles, blue, white, and brown, and some of a large size, mixed with sand, very much like those found at Budleigh and other places on the west coast. These are found to be extremely well calculated for road-making, and are accordingly the chief ingredient.

This soil is well suited to the Scotch Pine and Cluster Pine, which may be said to grow almost indigenously, for there are many considerable plantations having no other origin than the seeds wafted by the winds from others hard by. There are also single trees scattered over the whole moor, and the greater part of the country, which, thirty years ago was a bare common, is now covered with these trees, thereby altering the face of the landscape. The most extensive plantations are those belonging to government and the Bagshot Park estate, which extends for a great many miles to the south-west and west, there being attached to the latter alone ten thousand acres of this species of shrubbery. At Swinley Chase, before mentioned, a paddock of deer is kept for the purpose of supplying the Royal Hunt, whose establishment is situated upon Ascot Heath. These

deer are of the large red kind, and are in best condition in the spring, and then afford, as is well known, very long runs: but time and the march of science must work their way; railways are not safe things to cross, and hounds and horses have at times been run over by a train. The consequence is that for this and perhaps other reasons, the Royal Hunt is not what it was; after a few turns out near Sunninghill, they soon desert us, and go into the Buckinghamshire and Middlesex country. In former times, and indeed so lately as to be almost within the memory of persons now living, numbers of this species of deer were to be found on the wild, but from the open nature of the country, not easily to be approached. I remember, however, very well, when I was a little boy, hearing an old man, (now dead) who had been a notorious poacher in his youth, give an account of shooting two of these animals at one shot from the summit of one of the hills, having crawled upon his face for a very long distance: strange to say, the one lying nearest to him (for they were both lying down) was only wounded, but the furthest was killed on the spot. A second shot, however, despatched the already disabled beast, and they were then covered with heath and grass to be fetched away at night. In this way all the out-lying deer were disposed of, and when the inclosure took place very few were to be found in a wild state.

Under the white sand is usually found clay at a greater or less depth, and there are some excellent veins, and brick-kilns are numerous; and of late an attempt has been made to make ornamental pottery, for which the strongest kind is well calculated. Where the marshes are of any extent, they usually yield peat, and that in great plenty. This is peculiarly the case with Sunninghill Bog. This is strongly impregnated with sulphur, and burns so well that there are many cottages where the fires have not been out for many years. A very remarkable instance of this occurred about the year 1810, when part of this morass during a very dry summer, became, by accident or design, ignited; and from that time for two years continued to burn; ultimately, I believe, it went out of its own accord. Where this fire happened is a large black space to this day, extending to a great depth, and thought to be particularly adapted to the growth of American shrubs. It is indeed neither more nor less than vegetable ashes, and so far, perhaps, capable of absorbing a large amount of moisture; but I think the benefit it imparts, manifested by any manure is very doubtful. Peat is a singular substance, and when it is said to *grow*, we naturally inquire of what is it composed? The poor of Sunninghill have a regular cutting and getting in of what they call their "firing;" and each man has his portion of bog allotted to him, a particular part, of which he cuts, and another portion the next year, and so on, until as he would express it, "the first year's cut has *grewed up*." The peat,

when fresh cut, is composed of moss, roots, rushes, grass, earth, and pieces of wood intermingled, and is very heavy. It is cut in square clods of about a cubic foot, and stacked up in irregular pyramids to dry; when dry they become wonderfully light, and smell strongly of sulphur, in fact their weight arises almost entirely from the quantity of water they contain. Now the question of *growth* is worth considering. Does peat grow; or when a layer is cut off, does not this act as a relief and allow the sub-peat to rise, and with, perhaps, some growth of roots, etc., fill up the vacuum? I merely hint this, for it appears to me that it is, in fact, a thick stratum of vegetable matter, reduced to its present condition by pressure and subsidence, and very much in the condition which we may suppose coal once to have been.

The whole of this line of marsh abounds with the remains of trees, the branches and bodies of which are constantly dug up. Some of these specimens are very large, and I have seen tea-caddies, boxes, and had a walking-stick myself, made of it; this was oak, and as black as ebony; but birch and ash are also found, and there can be little doubt that these extensive morasses occupy the place where once a forest stood, now become subterraneous. How this burial took place can only be conjectured, the great difficulty which arises in the solution of the problem being that most of the trees are found in a prone position. Now it is not impossible to imagine a subsidence, whereby a forest might be overwhelmed, or more properly, submerged, but it would then retain something like an upright condition, or at all events, a horizontal one. Such were the earlier characteristics of this region, and such the alterations which it has at different times undergone. We now come to the inclosure of it by Act of Parliament, and the events which immediately went before that proceeding.

(To be continued.)

THE ENVIRONS OF BATH.

BY THOMAS FULLER, ESQ.

THE Nightingale is now in full song, but we have heard less of that most celebrated of all warblers this season than usual, perhaps from the continuance of north-easterly winds, and the extreme coldness of the nights. Occasionally in sheltered situations his delightful "jug-jug" was to be heard as evening closed in and other songsters were becoming silent, but not in the fullness and sweetness as heretofore. The Nightingale is a very sensitive bird, and when offended with these ungenial winds, either seeks warmer situations or becomes silent. A friend, who dwells in a pretty well-sheltered village about twenty miles from hence, informs me

that he does not remember to have heard them in greater perfection than this year, and observes that he has frequently known them suddenly leave his place for spots more protected from the cold winds prevailing at the time. It is difficult to imagine so delightful a visitor could be unwelcome anywhere, or under any circumstances, but a gentleman who lives a few miles from here once complained to me that the songs of the Nightingales disturbed his rest: how happy would many persons be under such a charming infliction. They are to be heard in many places in this neighbourhood, but the dell I have mentioned is not one of them, although so likely in appearance. I am inclined to attribute the cause to the consequence of the sewage of Weston being allowed to pollute the brook in its course through the village; it is an unfortunate circumstance, and operates very unfavourably in the foul appearance of the stream and offensive nature of the smell. That such an atmosphere is not agreeable to Nightingales I know, from what occurred at a place near Chippenham. The situation was a pretty cluster of trees a short distance from the town, known to be the resort of Nightingales for many years, but upon the deposit of manure of an offensive character near the spot, the Nightingales forsook it.

The grating call of the Land-rail or Corn-crake I first noticed on the evening of the 11th. of May, a few days later than last year; at his first appearance he is not heard till after sunset, but as the grass grows higher and affords more protection, his note is to be heard nearly all day. It is not fitting to say *appearance* in reference to this visitor, for he is never seen, and all attempts to discover him are vain. If you walk in the direction of his cry he is quickly heard from the opposite quarter, and on all sides. He is a perfect ventriloquist; few people about here have ever seen him. I once saw one with a brood of young on the turf at the road-side, but they vanished through the hedge in an instant. The punctual arrival of these birds is remarkable, and attended with more mystery than that of many others, from their incapacity for flight. Their note is said to be more monotonous than that of the Cuckoo; but there are times when even such sounds are pleasing, as happened to me on the evening of the 21st. of May—the hour was late, nearly midnight. Returning home from a visit in the neighbourhood, my path was through the fields; the beauty of the night, and the perfect tranquillity reigning around, induced me to sit upon a stile and contemplate. The fresh breezes which had prevailed throughout the day had disappeared with the sun, and nature was in perfect repose. The moon had passed the meridian, and was hastening to the west, and, being near the full, shone with considerable lustre, casting every object in strong shadow, and defining every point in the surrounding landscape, not a cloud being seen

in the heavens. Opposite to the moon, about the same distance east of the meridian, the planet Mars (now to be seen to great advantage) was shining in all his ruddy brilliancy. Not the rustling or moving of a leaf visible, or breath of air sensible to the feeling; and I cannot help thinking the silence would have been awful but from the note of the Corn-crake. I shall never forget how solitude was enlivened that night by the unceasing cry of that bird.

The village of Kelston joins Weston on the western side. At the junction of the parishes the River Avon makes a bend to the south, and with a bold sweep round west and north, forms a very pretty peninsula with elevated grounds, upon which is a mansion, known as Kelston House, surrounded by a beautiful park and richly diversified woods and plantations. As there is no public road through the domain, the pedestrian who perseveres in following the course of the Avon, will soon find his progress obstructed, and must therefore content himself with as near an approach as he can obtain, and listen to the chorus of the feathered inhabitants of the beautiful groves, whose charming variety of tints are sufficient to interest his attention.

The weather with a few occasional exceptions has not hitherto been favourable for loiterers, but I was so fortunate as to be at the place on one of the few genial days, and whilst listening to the numerous songsters hours passed away rapidly. Blackbirds and thrushes were answering each other; Wood Pigeons were cooing; and the laughing note of the Woodpecker chimed into the chorus. Larks, and many other birds, whose songs my limited knowledge of Natural History did not enable me to recognise, filled up the concert, in which we must not forget the Cuckoo—he was in high note, and very busy flying from one tree to another.

I have often been surprised, and am now quite offended, at the expression, so often repeated, of the note of this bird being monotonous. On this occasion the sound was clear and musical, and chimed in harmonious cadence with the wild natural performers around. The present is the time when his note is the clearest according to the quaint old rhyme. "In May, he sings all day.—In June, he alters his tune." When the country people say he becomes hoarse because there are no eggs to suck, which clear his throat.

(To be continued.)

NOTES ON NATURAL HISTORY.

IN A LETTER TO THE REV. F. O. MORRIS.

SIR,

I have lived in this colony for more than a quarter of a century, and during all that time I have been, in my small way, an observer of the

habits and histories of the animal and vegetable creation. I have very frequently been sadly disappointed, when reading books of authority on Natural History, at finding such very extraordinary blunders made, as to the most ordinary characteristics of animals; and having possessed your very valuable little magazine, "The Naturalist," from its commencement, and derived much amusement and instruction from it, I determined to write you on this subject, and to offer my poor assistance in arriving at the true history of birds and animals, with whose habits, appearances, and dispositions I am most intimate.

I was led to write to-day more particularly, by meeting in a work on Natural History, with an account of a bird not generally much known, but with whose habits I am very intimate, as it inhabits the savannahs and banks of a creek, (small river,) which runs for a long way parallel with the coast on which I live, and is not found anywhere else, so far as I know, in the colony, though found in numbers on the prairies on the banks of the Orinoco. This bird is the American Horned Screamer; the *Palamedea cornuta*; and called by the colonists the "Mahooka," from its cry, which much resembles this in sound.

This bird I find described as "very like the Spurwing,"—black in colour, with a red tuft on the shoulder. Now one would suppose that there must be truth in this, or whence the description? In reality the only likeness to the Spurwing is in both having two sharp spurs on each wing, inside the shoulder. But in every other respect the birds are widely different. The Mahooka is in size about that of a domestic turkey, or perhaps a little less; black the prevailing colour, with the belly and inside portions of the wings pure white. The outside of the shoulders of full-grown males a clear fawn-colour, marked with brown; the neck prettily marked with minute white spots. The head small in proportion to the size of the bird—very like a peacock's; the beak small and slightly curved. From the forehead projects a horny spike four or five inches in length, like the centre part (rib) of a feather deprived of its flags, quite hard and tough. Having shot birds with this horn in different stages of growth, and one without anything but a germ, I am led to believe that they periodically cast this horn, or perhaps in case of losing it, that they have the power of reproduction.

The great peculiarity of the bird consists in having on the inside of each shoulder, a strong spur or horny substance an inch and a quarter in length, and very sharp. This spur is triangular in shape, and within one inch and a half of it there is a second spur of about half that size.

It is evident that this weapon, or rather that these weapons, are intended for offence, and I myself have observed such use made of them among the birds themselves; but though I have killed very many, and taken many

wounded ones, and had them tamed, I never was attacked in any way by them.

I observed a peculiarity not before mentioned by any authority within my reach, namely, that between the skin and muscles of the body there is much air confined, which crepitates as you hold the bird. The legs are very large in proportion to the size of the rest of the bird, and the toes are still larger in proportion. This is characteristic of all birds living principally on grasses and seeds, in the submerged savannahs of our colony. The Mahooka lives entirely on seeds and portions of young plants, and I never found any trace of fish in the stomach. It lays two eggs, in size and colour resembling those of a goose. Its nest is made from pieces of decayed grass, clumsily formed, on the high grass of the savannah.

It is not at all a shy bird, and is easily shot. When disturbed it flies to the Ita palm trees, where the sportsman can easily stalk him.

This bird is easily tamed, and when slightly wounded can be let loose among poultry with every chance of living, provided there be sweet grass for him to pluck. Brown has expressed his surprise that he has not been domesticated like the turkey. I do not think that the flesh could ever be made so delicate as that of the turkey, even under any care and domestication. In the wild state it is very dark, and deficient in flavour.

Length of bird from beak to end of tail inclusive two feet; height, when erect, two feet six inches. In all illustrations which I have seen he is made very erect. This is a mistake, as in walking the body is kept parallel with the earth. The red tuft on each shoulder is a *pure myth*. And the same authority describes the horn as a "caruncle"—a sad mistake.

Now sir, can you forgive me for taking up so much of your time by my rambling letter. Should you suppose that my long sojourn in this country, and my knowledge of the history of some portions of its natives, could be made available for your little magazine, you have only to write, stating which subjects would be most interesting, and I would have pleasure in meeting your views. I have always been of opinion that the only mode of procuring reliable histories of beasts and birds, is by securing the knowledge derived from personal acquaintance with each subject. I was pleased at observing this well argued in a late number of "The Naturalist," and I am sure that we shall never have any history of value, until all is re-written from such sources. One writer gets information at second hand, which the next confirms, and thus in each history error is perpetuated.

People in different localities are shocked by those inaccuracies, but few ever take the trouble of sending the correct information. I observed lately a gross error in regard to Guinea Pigs. It was stated that there were

none wild in Guiana, though there were in Brazil. Now the fact is that they are in vast numbers here. But I need not enumerate all the mistakes I constantly meet. I have already written too long a letter to a total stranger, whose forgiveness I crave on the score of our common love for the charming study of Natural History.

I am a sugar planter, and live entirely in the country, and have constant opportunity for making observations. Should you at any time feel inclined to write to me, the name subscribed and the place whence I date this will readily find me, and I shall be most happy to afford you all information in my power.

I have lately procured an excellent work on Ferns, native and exotic, and have been classifying some of our very fine ones here. There are not many of them on the coasts, but during each dry season I take a run for a fortnight into the interior, and there they are in great variety. I then also shoot and stuff some birds for my amusement. I can very easily send to you any skin of bird or beast within my reach, and shall have much pleasure in sending any birds' eggs also, if you prize such and name those you would like best.

Your's obediently,

ALPIN GRANT.

Woodley Park, Berbice, British Guiana, June 24th., 1858.

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 186.)

10. *D. orion*?—I mention this species only (not having met with it myself) for the purpose of noticing a statement made by Mr. King, (Subst. 220.) He there affirms, that in the year 1853, he took *about* one hundred and twenty specimens of this then very uncommon insect. I do not wish to appear unnecessarily suspicious, but I must say I entertain very grave doubts as to the accuracy of this story. If true, the insect must, of course, be set down as common in Suffolk. I shall be glad to hear what Mr. Bree has to say on the subject.

N.B.—I think there is no doubt but that this is a Suffolk insect. Mr.
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Crewe has taken the larva. As I am called upon by Mr. Greene to express an opinion upon Mr. King's statement on this subject in the "Substitute," and repeated in the March number of "The Naturalist," I have no hesitation in saying that I do not believe a word of it. During the last ten or twelve years I must have sugared some thousands of trees in this neighbourhood, and I never saw a single specimen of *D. orion*. My brother, who lives near the locality mentioned by Mr. King, never saw it at sugar. He has, I believe, taken the larva, but never bred the insect. All we know about this insect entirely negatives the probability of its being taken in the numbers mentioned by Mr. King. I am afraid Mr. K. has multiplied his species by the same arithmetical system by which his four specimens of *E. versicolor*, taken in the same locality, became magnified into forty. (B.)

I beat two full-fed larvæ of this insect August 25th., 1856, in a wood near Ipswich. They were feeding respectively upon oak and birch. The larva very much resembles in appearance that of *L. salicis*, but is of course smaller, and the hairs are longer. I fully concur in the grave doubts entertained by my friends Messrs. Greene and Bree, respecting the accuracy of the story told in "Subst." 220. (C.)

11. *A. tridens*.—Larva by no means uncommon on hawthorn, and pupa (?) under bark on ditto.

N.B.—I think the pupa of this insect is decidedly more slender and delicate than that of *A. psi*. I am utterly unable to distinguish the perfect insects, and shall never cease to marvel that two such dissimilar larvæ should produce such precisely similar insects. The larva is polyphagous on trees and shrubs. (C.)

12. *A. psi*.—Common of course. The perfect insect is fond of resting on the trunks of fir trees during the day.

13. *A. leporina*.—One larva, but so stung as to be almost undistinguishable. It is the only time I ever met with the insect in any of its stages. If any of my readers should have a specimen or two to spare, I should feel much obliged for them.

N.B.—The larva is not at all uncommon in the midland counties, from July to September. Its favourite food-plants are birch and alder, but I have occasionally taken it upon aspen and Ontario poplar, and have known it to be taken on oak. I am strongly inclined to think that the old entomologists were right in making two species, *A. leporina* and *bradyporina*. I have once or twice bred the golden yellow larva, with black dorsal tufts, and the perfect insect has been the pale moth figured by Wood, No. 309, as *A. leporina*. I have not unfrequently, in past years, bred the grass-green larva with snow-white hairs, and the result has always been the moth figured, Wood, 310, as *A. bradyporina*. I should very much like to know whether the experiment has ever been tried on a large scale, and whether both white and yellow larvæ have ever been reared from the same batch of eggs. The larvæ, both white and yellow, turn to a dirty smoke-colour when they wish to spin up. They often eat their way some depth into rotten wood before forming a cocoon. It is very curious to watch them boring their way in. (C.)

14. *A. aceris*.—This insect was not uncommon in the pupa state under

bark on oak trees in Easton Park. I also frequently met with the empty pupa-cases under bark on sycamore trees at Playford.

N.B.—I have beaten this larva off maple, and my friend Mr. H. Bree, off birch. (C.)

15. *A. megacephala*.—Extremely abundant in the larva state. The stubborn tenacity with which they cling to the leaf on which they are feeding, is very remarkable. It does not seem much subject to ichneumons. The pupa may commonly be found under bark on most poplars and willows.

16. *A. alni*.—When on a visit at my friend's, Mr. Bree, a larva of this insect came to him by post. It was sent by his brother, the Rev. H. Bree, and was taken by him at Wolverston, near Ipswich. This insect seems to be scarce in the south, most of the specimens recorded having been taken in the north. It seems to me fairly entitled to be called a really rare species, being apparently uncommon everywhere; and few collectors, I believe, could shew a series of it,—many indeed have no specimen at all, in which unfortunate number I am very unwillingly compelled to rank myself. It seems, nevertheless, to be very widely distributed, as I have heard of its being taken (in addition to Suffolk) in Yorkshire, in the neighbourhood of London, and at Bristol.

N.B.—I am sorry to say that the larva mentioned by Mr. Greene, was stung by a dipterous insect, and died in a few days. This insect has been bred by Mr. Levett, of Finborough, in this neighbourhood, from larvæ found in both instances feeding upon elm; which tree I am induced to think its proper food. (B.)

My brother and I have taken this larva on beech, alder, black Italian poplar, and willow; and in Derbyshire, Buckinghamshire, Herts., and Monmouthshire. I believe it to be polyphagous, and though very rare, universally distributed. It is full-fed towards the end of July and the beginning of August. (C.)

17. *A. ligustri*.—Not common. The dark variety is, I think, rather scarce. I took the pupa in great profusion at Halton, in Bucks., and bred it in the proportion of about one in twelve. The beautiful gloss soon fades.

N.B.—Did any entomologist ever take the larva of this insect upon privet? I never did, but have found it in profusion upon ash, in Bucks. I think *A. orni* would be a far more appropriate name. I beat a full-fed larva, July 16th., this year. Is not this unusually early? I once beat a small larva from hazel, fed it up upon that tree, and bred the perfect insect. It is scarce in this neighbourhood, (Stowmarket.) (C.)

18. *A. rumicis*.—Decidedly scarce. A few larvæ feeding on willow. My friend Mr. Chapman kindly sent me some larvæ from Scotland. The perfect insect did not differ in any respect from its English brother, except in being rather darker and more glossy.

19. *L. conigera*.—Rare. On nettles once or twice, that is, the perfect insect, not the larva. I may take this opportunity of stating that I have found the common nettle one of the most attractive baits for moths of all orders. I have mentioned hereafter most of the insects taken in this way; and though none of them are rare, the hint may be useful to the beginner. They are found with a lantern, just after dusk, for about an hour.

N.B.—I once bred this insect from some larvæ taken by my brother in Radnorshire, feeding upon nettle. He told me that they resembled the larvæ of *A. triplasia*. I had the pupæ but did not see the larvæ. I have taken this insect flying over flowers in the hottest sunshine, and also by putting a candle at my bed-room window, and at sugar. (C.)

20. *L. lithargyria*.—Common at light, and on nettles at Brandeston. Rare at Playford.

N.B.—I took the larvæ of this insect in great profusion in Hants., in 1856, during the month of May, by examining the grass at the edges of the ridings in the woods by lantern light. The dark dorsal line alluded to by Treitschke, and copied in the Manual, is rather a series of oblong black spots. All the larvæ I found were feeding upon grass. I never saw a single one upon any other plant, though there were numbers amongst the grass. This larvæ closely resembles that of *N. xanthographa*, but may always be distinguished by its reddish colour and larger size. (C.)

21. *L. comma*.—Rare. At light.

N.B.—This insect, which in Derbyshire is one of our commonest insects, I have scarcely seen in Suffolk. I have found the best plan of capturing it is to stand in the long moving grass, and catch it as it flies in profusion over the flowers. It comes pretty freely to sugar, and is also very partial to the blossoms of the rhododendron. (C.)

22. *L. impura*.—Common at light, and on nettles.

N.B.—I took the larvæ in profusion by lantern light in company with those of *L. lithargyria*, feeding upon grass. They crawl up the blades to feed as soon as it gets dark, but completely conceal themselves during the day. (C.)

23. *L. pallens*.—Common at light, and on nettles.

(To be continued.)

A LIST OF THE INSECTS OBSERVED IN THE SOUTHERN PART OF THE COUNTY OF SUSSEX.

BY W. C. UNWIN, LEWES.

(Continued from page 160.)

NO. V.—INCLUDING MUSCIDÆ, CESTRIDÆ, VESPIDÆ, AND MELLIFERÆ.

MUSCIDÆ.—LATREILLE. (IN CONTINUATION.)

* *Stomoxys calcitrans*.—Common. Very troublesome in August.

S. stimulans.—Common. In August generally.

Anthomyia pluvialis.—A very distinct and common species, and commonly found on the trunks of trees in early spring; I have particularly noticed it on those of the ash.

A. canicularis et manicata.—Both common. I have observed many others of this genus, which we are unable at present to discriminate.

* From "*Stomoxys calcitrans* to *Tetanocera Hieracii*." These with the inclusive should have been inserted immediately after *Musca maculata*, (page 159,) the error having occurred by a misarrangement of the M.S. copy.

MUSCIDÆ.—LATREILLE. DIVISION II.—ACALYPTERES.

Scatophaga stercoraria.—Abundant on dung everywhere.

S. medaria.—Not uncommon. Frequents the willow blossoms in early spring.

Sciomyza pallida.—Not uncommon in the neighbourhood during the summer months.

Leria serrata.—Frequents windows, and oftentimes obtained by sweeping in the evening, also observed on the leaves of plants in May and June.

Dryomyza flaveola.—Of frequent occurrence near Landport, on the leaves of hedge shrubs, in July.

Tetanocera Hieracii.—This pretty little insect is very common on a moist bank by Landport, near Lewes; and to be found amongst the tangled herbage by using the sweeping net.

Opomyza combinata.—Occasionally found among the grass and herbage around the hawthorn bushes on the Downs.

Phytomyza notata.—Found with other small species of *Diptera* among grass, by sweeping.

CESTRIDÆ.—LEACH.

Gasterophilus nasalis.—This species was taken rather plentifully by a friend at Firle, in 1854.

Doliphus vulgaris.—Both male and female most abundant on the blossoms of the Cow Parsnip, (*Heracleum sphondylium*.) in July.

Bibio marci.—Abundant everywhere, and may be observed hovering in the air beneath the foliage of large trees in lanes, particularly on sultry days; appears usually in May.

B. flavicollis.—Not uncommon on *Umbelliferae*.

I have now completed my list of the *Diptera* of this district, as far as my knowledge of the species permits me satisfactorily; and although but a faint outline of its production in this order, (as I stated in my prefatory remarks, it has no pretensions to perfection,) still it represents generally some of the most beautiful, most conspicuous, and most generally distributed species. Many others have been observed of the more obscure and difficult genera as *Anthomyia*, *Tachina*, etc., and which it is hoped will at some future time be added to the list. It is a matter of regret that we but so rarely meet with an entomologist or collector who appears to take any interest whatever in this order, and yet surely this beautiful tribe of insects is worthy the attention and admiration of the young collector at least, some of the species being equally as beautiful, and equally as interesting in their habits, as the gaily-coloured butterfly or delicately-pencilled moth. They are the constant companions of our summer rambles, and enliven and cheer us with their lively and active habits. Until very recently we had no work which treated fully on this subject, but that blank is now amply filled up by Mr. Walker's valuable volumes in "Insecta Britannica"—*Diptera*, whose nomenclature and arrangement I have adopted.

Passing on from this order, I now introduce a list of the *Aculeate Hymenoptera* which have been observed within the prescribed district; the habits and economy of which are most interesting. These industrious and ever busy little creatures have engaged my especial attention for several successive

summers, and the more I become acquainted with them the more I admire their sagacity and instinct; although at present I am not in a position to record an equal number of the wild bees to that by the late Rev. Mr. Kirby, within a given locality. It is related in his "Life," page 195, that, "the total number of *Melittæ* described is one hundred and eleven; of these eighty-three were taken in Barham. Of the genus *Apis* one hundred and twelve; of these seventy-one were found in Barham;—thus making a total of one hundred and fifty-three distinct species of wild bees found in a parish containing one thousand five hundred and seventy-three acres of land." Our Downs are particularly favourable for the *Bombi*, and we possess more than two-thirds of the indigenous species, and all the *Apathi*. In conclusion I would remark that I have taken both Mr. Kirby's "*Monographia Apum Angliæ*," and Mr. Smith's "*Monograph of the Bees of Great Britain*,"* as my text books, this latter more particularly, and whom I have followed in my arrangement; it is a work which cannot be too highly commended, and ought to be in the hands of every student. I would also hope to see this list followed by similar ones from other localities, and also to know that the study of this beautiful and truly intelligent tribe of the insect world is daily increasing, particularly among the rising generation of entomologists.

VESPIDÆ.—WESTWOOD.

Vespa crabo.—Rarely and locally met with, more frequently in houses than elsewhere in August and September.

V. vulgaris.—Very abundant some years, generally distributed; the females, it is well known, appear in early spring, and the gardeners in this neighbourhood usually offer a good reward for every individual which may be destroyed.

V. rufa.—I have never found but the female of this species, and that but rarely; and I believe it does not appear to be so common generally as *V. vulgaris*, and its societies are less.

V. sylvestris.—More common than the last species; the nest is a very beautiful object when constructed in a fir tree.

MELLIFERA.—LATR. FAMILY I.—ANDRENIDÆ.—LEACH.

SUB-FAMILY I.—OBTUSILINGUES.—WESTWOOD.

Colletes succincta.—Rare; found near Brighton in July.

Prosopis annularis.—Rare; near Hove, on the coast, on the flowers of *Sinapis arvensis* in June.

(To be continued.)

EXTRACTS FROM SMITH'S CATALOGUE OF BRITISH HYMENOPTERA.

In order to give our readers a greater interest in British Bees, we shall occasionally extract from Mr. Smith's admirable little work, "*Catalogue of British Hymenoptera*," some of his remarks upon the habits of the principal genera. We hope this will induce them to purchase this model of a monograph.

* Catalogue of the Bees of Great Britain, in the Collection of the British Museum. By Frederick Smith, M.E.S. Price 6s.

FAMILY I.—ANDRENIDÆ.

GENUS COLLETES.

THE economy of the insects which compose the present genus has been frequently quoted from the interesting history given by Reaumur, who found them constructing their burrows in the interstices of stone walls—the spaces between the stones no doubt being filled with earth or some soft kind of mortar; they are found burrowing in light sand-banks. One species, *C. Daviesana* of Kirby's MSS., is extremely abundant in many sandy districts, particularly in the county of Kent; where, as I learnt on having an opportunity of examining Mr. Kirby's own interleaved copy of "The Monographia," he himself had observed it, near Maidstone. The burrows of these insects are from eight to ten inches in length; they are lined at the further end with a very thin transparent membranaceous coating, resembling gold-beater's skin: the insect having stored up a sufficient supply of pollen and honey in a semi-fluid state, closes up the cell with a cap of the same substance as the lining of the tube; this cap is stretched flat across, like the parchment on a drum-head; a little within she next constructs a concave cap, serving as the end of the cell; her former labour is then repeated until she has furnished six or eight cells, when the whole is completed. There is little doubt that the same bee constructs more than one of these tubes, as there never appears any trace of a second tunnel running into the first, as may be observed in many other species of solitary bees, particularly *Halicti*, *Andrenidæ*, and *Anthophoridæ*. These bees are subject to the attacks of two parasites, one feeding upon the larvæ, the other upon the pollen; the first is a Dipterous insect, *Miltogramma punctata*; these flies are very frequently to be seen entering the burrows of the bees, and have been often bred from the cocoons of *Colletes*; the second parasite is the beautiful little bee, *Epeolus variegatus*, which has been very frequently reared from the cells of *Colletes*.

These bees are gregarious, forming large colonies, particularly the *C. Daviesana*; and although their numbers are to some extent reduced by the parasites named, still their destruction by these means sinks into insignificance when compared to the wholesale slaughter committed upon them by *Forficulæ*; these omnivorous enemies devour indiscriminately pupæ, larvæ, or pollen; and in some situations they abound to such an extent, that not less than three-fourths of the bees perish through the attacks of these destructive insects.

There are four known British species of this genus, the type being the *Apis succincta* of Linnæus: the authentic specimen is preserved in the cabinet at the Linnæan Society's Museum.

GENUS PROSOPIS.

THE bees of which the present genus is composed, being destitute of the usual apparatus for collecting pollen, were long regarded as belonging to the family of parasites. Some years ago two of the species were bred from bramble sticks, the larvæ having been exposed and found to be arranged in the same regular order as in the acknowledged industrious, or working species: this observation was made by Mr. Thwaites in 1841. Since that time I have re-

peatedly bred them from a similar nidus. But all doubt of their habits has been removed by the observations of Mr. Sidney Saunders, who has bred an Albanian species in great profusion: they construct their cells in bramble sticks, which they line in the same manner as *Colletes*, with a thin transparent membrane, calculated for holding semi-liquid honey, which they store up for their young: the Albanian species were usually much infested by a *Stylops*. I had a very interesting nest of one of these bees given to me: the bee was observed to have chosen a hollow piece of flint stone, on breaking which a number of the silken cocoons were found, some containing perfect bees when received. Mr. Walcott has in his collection two specimens of this genus of bees, which have apparently been attacked by a species of *Stylops*; the fact has not been previously observed in this country, but in the "Transactions of the Entomological Society," vol. i., new series, p. 58, will be found an interesting account of a species of *Stylops* which attacks *Prosopis rubicolia*, found by Mr. S. Saunders, in Albania.

(To be continued.)

EXTRACTS FROM A LETTER
RECEIVED FROM A CLERGYMAN, RESIDENT, A FEW
YEARS AGO, IN ONE OF THE ISLANDS
OF THE ESSEQUEBO, BRITISH GUIANA.

COMMUNICATED BY C. R. BREE, ESQ.

"FANCY me just mounted on my horse and starting for a ride across the island, in spite of a vertical sun. Quietly I proceed down a narrow road,—half grass, half path, deep dykes on either side, shelving off abruptly—on one side rows of trees, covered with fruits in various stages of perfection, forming something like a shade; on the other a thick bush, that is, trees, shrubs, and parasitical plants,—creepers and climbers, some of great beauty, ascending to the tops of the highest trees, and hanging down again to the very bottom in the wildest and most graceful festoons,—wantoning in luxuriance. Through this bush, which is here but a narrow slip, occasional glimpses of this most glorious river may be seen, rolling into the ocean at about four or five miles an hour. About four miles off, another island, equal in size to this, and beyond it, again, the mainland, stretching far into the west, may be seen. As I proceed my attention is arrested by a noise above. I look up, and behold a large flock of parrots on their way to their feeding ground. Suddenly, again, my horse makes a start, and almost throws me on his neck. I look down, and see a large guana, one of the lizard tribe, darting rapidly through the dyke into the bush, its beautiful and gorgeous colours flashing and sparkling through the waters. In vain I urge my dog, a beautiful spaniel, in pursuit; he barks, and jumps upon my horse, or springs into the water to cool himself, looking up into my face with the most provoking indifference.

I rein up my steed, and proceed. Again he snorts and backs, while a large snake, here called the coral snake, beautifully-coloured, with head erect

swiftly trails its length to the bush, and disappears from sight. Onward we go. A peculiar humming noise next attracts my attention, and lo! the least wee bird imaginable, with beautiful plumage, is seen with its long bill extracting honey from the flowers, upon which it does not even rest, supporting itself in the air, its wings vibrating, and producing the peculiar sound from which it derives its name. My butterfly-net is in instant requisition, but I miss my aim, and the little creature wings its flight to sip nectar on other flowers, and wanton in its enjoyment. Pondering upon my disappointment, my reverie is disturbed just in time to secure some gorgeous butterflies, which almost fly into my face.

I continue to proceed for some miles further on, tempted every moment by a plunge into the water of some animal, or the louder call of some magnificent bird winging its course into the unknown interior. Then, again, my powers are quite inadequate to give you any just idea of the extraordinary beauty of the foliage; the freshness and the brightness of the green of innumerable shades; the leaves themselves of various shapes, exquisitely ribbed, and so varied that one is never tired of examining, and of a size perfectly to astound our liliputian notions of vegetation. The seed-vessels are so remarkably and curiously formed that admiration is never weary. This beauty of the leaves and seed-vessels, and their infinite variety, is a subject which has excited my astonishment as much as anything I have seen in this land of vegetable wonders, and yet, strange as it may appear, I have never seen it noticed by travellers, who, upon these subjects, usually speak in very vague and general language. I have tried repeatedly to preserve some of the leaves in all their perfection, but hitherto, from the exceeding moisture of the atmosphere, without success. The singular and finished manner in which the birds build their nests, also furnishes occasion for remark and wonder; they are generally pendant from the extremest branches, and this to prevent snakes and other animals from molesting their young. They wave to and fro with every breath of wind, and injured by none, not even the strongest, so admirably are they constructed, and really have a most graceful appearance.

A few minutes more riding brings me to one of my schools; and here there is interest of another kind to the thinking and philosophic mind. It is almost impossible to avoid being amazed at the appearance of the little blacks, and their manner of pronouncing some of our words is diverting enough.....Having spent my time here I again take horse and cross the island, through woods rich in beauty, to inspect the progress of my church. Just as I enter a cool glade, with senses keenly alive to the beauties around me, Carlo begins to snuff the air and shake his ears, as if stung by some small insect; on the ground I perceive a well-worn path to an ant's nest, and millions busily at work. I trace them to a lofty tree hard by, and some forty or fifty feet from the ground I observe an extraordinary excrescence, four or five feet or more in circumference, which, after examination, I found to be their nest, in shape and appearance the exact counterfeit of a bee-hive. On other trees I discovered several of these nests differently constructed, but all highly finished; some large, and others smaller.

The ground, too, has its colonies of them, forming towns and cities covering many square yards.

Again I move on, and at some little distance,—aye, is it possible! What familiar sound is this that breaks upon my ear? No, surely it cannot be in the wild and lonely woods of South America! And yet there is no mistaking that sound! It must be my old friend the itinerant knife and scissors grinder! Imagination is now off at a gallop, and beautiful green lanes, village greens, church spires, sweet retired valleys, and the lovely hills of my beloved country fill the mind. To the right hand and left, backwards and forwards, I intently gaze for the solution of my doubts; but nothing human meets the eye. Down, down are all the sweet and thronging thoughts of home; back comes the startling reality, and I find myself in the immediate neighbourhood of a colony of black beetles, called scissor-grinders, from the striking resemblance of their noise to that made by the personage alluded to.

The heat of the day and exercise together have produced thirst and fatigue. I dismount, tie my horse to a tree, and plunge into the bush. A short search brings me into the neighbourhood of the pine-apple, here indigenous. I select one weighing about ten pounds, eat a few slices from it to refresh my body and allay my thirst, throw the rest away, and am again on my route to the church.

I am located in an island about twenty miles 'long by two or three broad, in the mouth of the Essequibo River—a noble stream, here about thirty-five, some say fifty miles broad. Its course is many hundred miles in the impenetrable forests of the unknown interior. The mouth of the river is for many miles thickly studded with islands, some inhabited. The one on which I reside is perfectly flat, and were it not for embankments, would be under water at high tides. A great portion of it is what we call bush, that is, an impenetrable wood. It produces most of the tropical fruits. The roads are bad and narrow, and the country is intersected with dykes for the conveyance of the cane, when cut, to the sugar-houses, in barges. The staple commodity is sugar, which is produced here of the best kind, from seventeen estates, which belong to proprietors who reside principally in Europe. There are a few European mechanics and storekeepers, the remainder of the population, between four and five thousand, entirely black.

With regard to the lately emancipated class, I could write volumes, and hope some day to enlighten a few of our very good people in England, who so largely exert themselves in their favour, with no knowledge but from most exaggerated statements of their condition. They are idle, deceitful, most ignorant, untruthful, and very dishonest, and, above all, notoriously ungrateful. Their wages are high, and half a week's work will earn them sufficient for the support of the whole week, and, moreover, maintain them in comfort unknown to an English labourer. They go into the field when they please, and return when they please. The masters scarcely dare remonstrate, for labour is so scarce that many estates are going out of cultivation."

ON THE DISEASES OF SILKWORMS.

COMMUNICATED BY C. R. BREE, ESQ.

At the Meeting of the "Académie des Sciences de Paris," of June 7th., a very interesting and important paper was read by M. Guérin-Méneville, entitled "New Observations on the Chemical Characters of the Diseases of Silkworms." The paper is the result of thirty-eight experiments instituted during the last five or six years, and its contents are extracted from M. G. Méneville's Journal, "D'Observations à Sainte-Tulle."

These investigations are especially interesting to the manufacturing interests of France. In this country we buy and sell and wear our silk—we hear with wonder of a dealer in the commodity leaving at his death a fortune of four millions of pounds; but I am afraid we do not pass many thoughts upon, or institute many investigations into the diseases or economy of the caterpillar, by which all this beauty, usefulness, and riches is produced. But *qui facit per alium facit per se*; and as all our Entomologists are interested in the well-doing of their larvæ, I shall make no apology for giving an abstract of this paper; and I may take the opportunity of remarking that I hope from time to time to give my readers a resumé of the most interesting papers on Entomology, published in the "Revue et Magazin de Zoologie," which is undoubtedly one of the best and most useful Natural History periodicals in Europe.

"In modern days," remarks M. Guérin-Méneville, "all the diseases of Silkworms are confounded with the epidemic, which has received the name of *Gattine*. Nobody talks of anything else. The *Muscardine* even is nearly forgotten, and it thus happens in regard to this disease as to great epidemics affecting the human species, such, for instance, as Asiatic Cholera.

Having with great trouble procured three or four Silkworms, dead or dying of *Muscardine*, I found that their blood was intensely acid; litmus paper being turned red immediately by it. This redness was removed and the natural colour restored by immersion into the blood of those affected by *Gattine*. The experiment repeated many times during the last few years, always with the same result, demonstrated the acid condition of the blood in the one disease, and its alkaline condition in the other. I have since satisfied myself by many experiments that the blood of Silkworms, affected with the various maladies—*Passis*, *Arpians*, *Luzettes*, *Vache*, *Flats*, etc., is always very decidedly alkaline.

As a result of my experience, I class the diseases of Silkworms under two divisions. 1.—Those resulting from an excess of alkaline matter, which always terminates in a putrid softening. 2.—Those resulting from an excess of acidity, (*Muscardine* and its varieties,) which end in the hardening of the Silkworm, and the development of a fungus growth, (the *Botrytis*.)

It has further resulted from my experience and a great number of observations made in the laboratory and in the cultivated grounds, that the employment of acids is indicated when the worms are attacked by the alkaline disease; that this excess of alkalies proves a general feebleness in

their organism, which is caused by a less substantial nourishment, and propagated from generation to generation. Also that the disease is cured or a favourable amendment produced, by sprinkling the mulberry leaves upon which they feed with vinegar, pure or diluted; with sulphuric acid, diluted with water; or powdering with flour of sulphur, or fumigating with sulphurous acid.

On the contrary the disease called *Muscardine* is cured or prevented by sprinkling the mulberry leaves with liquid alkalies, which will neutralize the acidity of the blood produced by leaves too rich in nutritive matter, or other unknown causes.

My reason for believing that the acid disease of Silkworms is produced by leaves too rich in nutritive matter, is that the disease appears principally when they are thriving best—when the trees have no disease—and it appears on the finest and most vigorous worms. The disease appears most frequently at the moment when the worms are best developed, when their aspect is most promising, and when they devour with avidity the excellent leaves procured for them from the best-cultivated trees.

On the contrary the alkaline nature of the liquids of the worms is manifested always when the vital force is weak, produced by an insufficient nourishment; also when the leaves are diseased, when they are given to the Silkworm too old or too young, the want of proper ventilation, a deficient respiration caused by obstructed stigmata—these are the causes which combine to produce excess of alkaline matter in the blood of Silkworms, and all those which die of this cause, arrive at a condition of putrid decomposition.

This feebleness in the vital functions of Silkworms suffering from alkaline disease is very evident in the worms themselves, and is well known to those by whom they are reared; also the Silkworm is developed slowly, and drags on its existence in a languishing manner; its moult is painful, and often prolonged over several days, and they spin up at different periods.

It is consoling to believe that this epidemic, which is not contagious, has begun to enter into its period of decline; the *Gattine* does not now generally attack worms until a later period than in preceding years, and does not shew itself seriously till after the fourth moult. A great number now recover, while in preceding years all perished."

Nomenclature.—With reference to Mr. Bree's remarks on the British Museum Lists, in the last Number of the "Naturalist," I have referred to those I have by me and cannot see a single B. M. attached to any of the names of species, as stated by Mr. Bree. So again the list of *Diptera* gives only the names of those in the British Museum collection, and does not, as he says, on the title-page, in that instance at all events, even profess to give a complete list either of the whole order or of any of the families in it. The same remark applies to the "List of the specimens of Lepidopterous insects in the collection of the British Museum," as thus stated at least on the title-page and the several other lists. It is only on looking into the prefaces that one sees which do give more than they profess on their title-pages, and which

do not. I find, however, that their other lists, in the shape of nomenclatures, do profess to give the names of all the British species, as those of the *Diptera*, *Anoplura*, *Euplexoptera*, *Orthoptera*, and *Hymenoptera*; but this is only indicated in the preface, and not at all on the title-page, but rather the contrary. Thus if a person orders the "List of the species of British animals in the collection of the British Museum—Part XV., nomenclature of *Diptera*," he will, as Mr. Bree says, have a complete—or *quasi* complete—list of the British species, but if he orders the one with the similar title, "Lists of the specimens of Dipterous insects, in the collection of the British Museum," he will, as I said, have only a list of the species possessed by the Museum; but how is any one to know beforehand by intuition that there are two lists of *Diptera* etc., and that with such similar titles the one gives only what it professes to give on the title-page, while the other gives more? As to any general list being published hastily, I have never recommended any such course, and I think that that notion is hardly to be attached to what I said, seeing that Curtis' list was published twenty-one years ago. If we wait until every species has been discovered and described, we shall wait I think longer than we need: what I advocate is some one's doing now, with the information we at present possess, what Curtis and Stephens did in like manner in their day. As to its being impossible to be done by any one man, "What man has done, man may do," and to come to more "modern instances" than Curtis and Stephens, if my late friend Mr. Hugh Strickland could by himself compile a general list of the whole of Ornithology, Foreign as well as British, why cannot some Entomological Strickland do the like by Entomology, British alone, with all the help he has from others? Who are the workers in all the several departments? How are the public to know that there are workers privately in all of them, and why cannot the results of their several labours be put together? How, moreover, are we to know that they are all at work simultaneously, and will all conclude simultaneously? How, too, can Mr. Bree guarantee that by the time that the last of them has finished, those who had finished before him will not have to begin over again, especially when it is so the fashion to alter everything, to suit the notions and idiosyncrasies of the different writers. I cordially agree with Mr. Bree that Dawson and Clark and others have done their parts well, and all that I wish to express my hope of is that the results of their labours may not be left isolated, and comparatively valueless, but combined as soon as may be with those of others in one general list, like those of Curtis and Stephens, "*Teres atque rotundus*."—F. O. MORRIS.

Hardish Jaws.—We copy the following from the "Report of the meeting of the Académie des Sciences, of June 21st., 1858," in the "Revue et Mag. de Zoologie," for June:—"M. le Marechal Vaillant, at the meeting of the 7th. of September, 1857, placed before the Academy, balls brought from the Crimean expedition, in which larvæ of insects had hollowed out galleries to reside in during their metamorphosis. He now presented a memoir, by M. Victor de Motschoulski, upon the insect which

perforated these leaden balls of the French army in the Crimea. This paper, which contains many details already known to entomologists, is very complete, and full of interesting observations. M. de Motsehoulski proves, among other things, that the perforation of eartridges in the Crimea has not been noticed in the Russian army; and that the *Urocerus juvenis* has not yet been observed in the Crimea, and appears in general very rare in Russia. As we have noticed in this review, (in giving an account of the communications of the illustrious Marshal,) M. de Motsehoulski said also, that the perforations in the lead were made with the mandibles of the larvæ of the *Urocerus*, in the same manner as all other insects, and simply to form galleries."

Miscellaneous Notices.

Black-headed Gull, (*Larus ridibundus*).—At half past six, p.m., on the 27th. of June, a flight of thirteen of these birds, followed at an interval of half a minute by a second of six or seven more, passed within a hundred yards of me whilst sitting in the garden, their height being not more than fifty feet above the ground. Feeling surprised to see these beautiful birds *en trajet* so early in the season, and that too through such a smoky atmosphere as that we have within a mile of Leeds, I carefully watched their movements. Their course, which was very direct, and right to windward, was from E.S.E. to W.N.W., passing over the southern part of Temple Newsam Woods, whence I traced them, till they were lost in the smoke between the churches of St. Saviour's and Quarry Hill, in the densest part of Leeds. From Morris's "British Birds" I learn there is a gullery at Twigmoor, near Glandford Brigg, in Lincolnshire, the estate of Sir John Nelthorpe, Bart. This preserve I find to lie almost exactly in the direction, at fifty miles distance, at that from which these birds proceeded, and that if continued the line would pass south of Skipton and north of Lancaster to Morecambe Bay. I first made the acquaintance of these graceful birds, under the name of "Askey's Gulls," "Askew" being so pronounced on the Border, at Pallinsburn, when salmon and trout fishing on the Tweed, Tell, and Beaumont, and have since frequently seen them on their passage through the valley of Craven, where they generally remain a short time, but never earlier than the time specified in Morris's "British Birds;" namely, the end of July or beginning of August. Indeed I have observed them much later than the 12th., but as I am at a loss to account for their early appearance, unless it be from the general precocity of the season, perhaps parallel experiences of some of your contributors may assist me and other embryo naturalists.—EDWARD JAMES MAUDE, Knostrop, Leeds, July 2nd., 1858.

Egg of the Cirl Bunting, (*Emberiza cirrus*).—I have now in my collection a very small egg of the Cirl Bunting, found near this town; measuring five lines and a half long, by four lines and a half wide, or smaller than the Egg of the Golden-crested Wren.—J. T. G. HAWKE, Liskeard, Cornwall, July 30th., 1858.

Proceedings of Societies.

Thirsk Natural History Society.—Botanical Exchange Club.—The monthly meeting of the Thirsk Natural History Society, was held on the evening of Wednesday the 7th. instant. Mr. Peter Davidson, of Thirsk, was admitted a resident, and the Rev. W. M. Hind, of Bayswater, and Mr. H. Ibbotson, of Dundee, corresponding members of the society.

Mr. J. G. Baker, gave an account of an excursion to Halnaby Carr, in search of *Eriophorum gracile*. The locality is a boggy piece of ground, and thickly covered with trees and brushwood, perhaps a couple of acres in extent, that lies about a mile from Croft, on the left hand side of the road to Richmond. He had noticed both the common species of Cotton-grass, but was not able to find that for which he principally went in search. *Ranunculus lingua*, *Pyrola rotundifolia*, *Carex teretiuscula* and *stricta*, were met with, and also *Hypnum nitens*, and a large quantity of *H. Blandovii*, some of it in fruit. He exhibited specimens of these, and also of a *Papaver* with sub-rotund capsule, which he considered to be probably a variety of *dubium*.

Mr. J. H. Davies exhibited specimens of *Tortula papillosa*, recently gathered by himself at Fuller's-court Garden, near Ballitore, County Kildare, and communicated the remaining portion of a paper by Dr. Carrington, on the British *Orthotrichæ*. Mr. W. Foggitt exhibited specimens of plants from Newsham Carr, near Kirby Wiske, North Yorkshire, including examples of *Cicuta virosa*, *Ranunculus lingua*, *Rumex hydrolapathum*, *Carex teretiuscula* and *stricta*. *Lemna polyrrhiza* was also noticed at the same locality; and he laid upon the table *Jasione montana*, from Howe Carr, near Sand Hutton.

Yorkshire Naturalists' Club.—This Society, instituted for the purpose of extending an interest in the various departments of Natural History throughout the county of Yorkshire, has, during the past nine years, enjoyed uninterrupted prosperity. At present it numbers nearly two hundred members in various parts of the county, many of whom are eminent for their attainments in various branches of Natural History.

The Society holds its meetings in York, on the first Wednesday in each month, when specimens are exhibited and communications read on subjects

of interest connected with the objects of the Society. The Club has an excellent Library, to which valuable additions are being constantly made to meet the requirements of the members.

We purpose from time to time to report such of the proceedings as we may think of interest to our readers.

At the Meeting held in July last, several interesting specimens were exhibited, amongst which we may notice the following as being of most importance:—A collection of Eggs by Mr. Graham, including the Osprey and Rough-legged Buzzard, from Germany; Reed Warbler, Red-headed Pochard, and Great-crested Grebe, from Wassand, taken on the 20th. of June, by Mr. Graham; the Woodcock from near Retford; the Knot from Iceland; and the Dunlin from Sutherlandshire. Mr. Graham also exhibited some specimens reared from the larva of a somewhat rare insect, *Clostera reclusa*. Some very fine specimens of a rare shell, *Valvata cristata*, taken in the River Foss, near York, by Mr. Wakefield, were also exhibited.

The Querist.

I HAVE shot a Tern which I cannot make out.—Size nearly as big as the Common Tern, but the legs much shorter. Bill *entirely black*; inside and angle of mouth reddish orange; feet brownish red; webs nearly crimson; claws black; forehead and crown white; hind-head and part of hind-neck variegated with black, that colour stretching round the eyes towards the bill; upper parts light greyish blue, tinged with brown on the wing coverts. Primaries, very like those of the Common Tern, but darker, dark grey, the outer web of the outer feathers black, the rest having the inner edges and tips white. The fore part of the back and rump is lighter than the middle. The tail is white, the feathers having their outer webs grey; chin, throat, breast, under parts, upper and under tail coverts, and tibial feathers white. The wings are very nearly, if not as long as, the tail. I shot this bird on Monday last, the 19th., and have since stuffed it, as an addition to my small collection. It was in company with Terns of the Common and Sandwich kind, and seemed rather tame, for it flew low, whilst the others hovered high above, emitting their creaking cries. Its cry seemed shorter, and more like the word 'erak.'—W. B. Wood, Strathairly, Leven, Fife, July 22nd., 1858.

Would any practical entomologist inform a beginner what is the quickest and best way of killing insects.—WILLIE, July, 1858.

[There is nothing so good as chloroform. See the instructions in the "Aphorismata," printed with my "History of British Butterflies."—F. O. MORRIS.]



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BY C. R. BREE, ESQ.

O LORD, how manifold are Thy works! in wisdom hast Thou made them all:
the earth is full of Thy riches.—PSALM civ., 24.

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. In consequence of Mr. Bree's change of residence, all communications for the Entomological department of "The Naturalist," must be addressed after August 14th., until further notice, to MR. FAWCETT, *East Lodge, Driffild*.

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NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

(Continued from page 200.)

CHAPTER V.



Few of the English monarchs of the last few centuries have been addicted to war; if they engaged in it, it was usually from compulsion and not from choice. At all events, although, even as in the case of William the Third, they actually led their armies in person, it was not from a mere love of arms. This was not the case with George the Third; of indomitable bravery and restlessness of spirit, he was a promoter and admirer of warlike achievements for their own sake, and would willingly, nay, was with some difficulty dissuaded from taking an active share in it. Hence the accounts which were constantly reaching England of our conquests and actions abroad were a goad to his valiant nature, stimulating a military ardour which it was impossible for him to satisfy. Reviews, military pageants, and such exhibitions were his delight, and a happy expedient was at length hit upon, which, at the same time that it kept in constant practice the household troops, indulged him to the utmost in his darling propensity. This was no other than the sham-campaign that kept up during the summers of 1795-6, the spot selected being that very district which I have now been describing, upon which twenty-five thousand men, horse, foot, and artillery, were encamped. The ground, from its undulating nature, was every way suited for the purpose, and as the court was resident chiefly at Windsor, it was most convenient for his majesty. Regular plans were laid out beforehand as to the future movements of the army; tents were pitched and positions taken with as much care as if the fate of nations, instead of the pastime of a single individual depended upon the issue; in short, what we have lately seen take place at the camp at Chobham, which is within a couple of miles of the spot, was there enacted on a larger scale, and I have heard a veteran officer, who had witnessed the serious original, say that nothing could be more like an actual field of battle.

During this time the king and royal family came daily to view the proceedings, and a spacious marquée was erected upon King's Beech Hill, one of the highest points of the country. This spot, which is well-known to every one who has ever resided in the neighbourhood, for the extent of the prospect to be seen from its summit, and the consequent beauty of its situation, lies on the very verge of the parish of Old Windsor; indeed the northern half of it is in Sunninghill. At the time I speak of it was crowned by six beech trees, then perhaps a hundred years old, and

as they had no parallel for many miles, formed a most conspicuous point, and were known as "The Beeches." Immediately beneath the trees a small residence, with a cottage attached, had been some years previously built by one Ford, who sold it to my grandfather, who was the owner of it at this period. This cottage was, I believe, the first habitation ever built on the spot, and was inhabited by an old man named Biggs, who gained a precarious subsistence by keeping fighting-cocks, and attending fairs and markets. Living in a lonely manner he obtained among the thinly-scattered population the reputation of having money, and whether well-founded or not, it excited the cupidity of one Stephen Dicker, a notorious highway-man of those days, who haunted the neighbourhood of Broomhall and Urly Wood, as a low ground near was called, and surprising the old man one evening in winter, he beat him unmercifully and left him, believing him to be dead, stealing from the house a gold-laced hat and some trifling articles; but, contrary to his expectations, the old man recovered, and appeared against him at the next Reading assizes, where he was condemned and executed for the crime; and I have seen a copy of the indictment. This was, I think, one of the last of that race of mounted desperadoes for which Bagshot and Hounslow Heaths were so famous.

This hill, under a grant from the crown became our property, and is such at the present day, and here it was that my yearnings after the study of nature were first indulged. Here I became known as a bird-preserver, and it may easily be imagined that scarcely a tom-tit came to grief without being brought to me as a good specimen for "Master Oliver," as old Trapbois said, "for a consideration." Such rarities as were really brought to me, or came under my observation, I shall hereafter refer to.

(To be continued.)

THE ENVIRONS OF BATH.

BY THOMAS FULLER, ESQ.

(Continued from page 202.)

THE note of the Cuckoo was first heard in this neighbourhood on the 15th. of April, since which time I have enjoyed many opportunities of observing him, and am of opinion that his plumage is of lighter shade than at a later period of his sojourn amongst us. The idea might be merely a supposition, suggested perhaps by the contrast in colour from that of the numerous Rooks and Jackdaws, whose sable hues I had for so long previously been familiar with.

The dell mentioned in my last communication, although not so extensive

or secluded as desirable, is less disturbed by visitors than any other spot within reach of a moderate walk. I am therefore content to make the best of it, and even in its limited space manage to find amusement; but it is grievous to say that a mischievous spirit has found entrance, of which there is evidence to be seen at every visit; the following is an instance:—One morning at the beginning of April, soon after sunrise, I was just entering the place, the chorus of songsters induced me to sit upon the gate leading into the field, and listen to the chorus of their varied notes; the grass was loaded with crystal drops of dew, sparkling like diamonds in the morning sun; increasing pleasure was gradually stealing over me, when my contemplations were suddenly roused by sharp painful sounds, and upon looking round saw a ruffian of a fellow striding towards me with a blackbird in his rude grasp; he had just knocked it down with a clod of earth, the blow had struck the poor thing on the head, filling one of its eyes with dirt, which the unfeeling captor was wiping out with a rough cotton handkerchief. With great difficulty I controled my disgust, and mildly remonstrated upon the cruelty of the act, but with very little effect. Another instance came under my observation this afternoon, and the vexation being fresh in my mind I cannot forbear relating it. The day has been remarkably fine, and now whilst I am writing at a window looking to the west, the sun is slowly descending a little to the north of west, at an opening between two high hills, with majestic brilliancy, and the crimson tints of the sky as he gradually disappears in the distant horizon, is a study for the artist, which must be seen to be appreciated—but is there pencil or art capable of portraying the liquid fire of the glorious luminary, richer than molten gold. Pardon this digression; the sublimity and grandeur of the scene will excuse it.

I had been to the dell this morning and the beauty of the afternoon induced me to go again. Among the several objects of interest were a pair of Magpies. They had built their nest nearly at the top of one of the loftiest trees; both birds were often seen: but, although so high, they always flew away at my approach. From seeing one only lately I conclude the other was sitting in the nest, which is admirably adapted for concealment, being covered at the top, and entered by a small hole at the side, through which it is surprising how so large a bird can enter. I had flattered myself this pair of birds, from the elevated situation of their nest, were safe from molestation; but the event proves otherwise, for upon my visit this afternoon neither bird could be seen, and the feathers of a Magpie scattered over the grass plainly told their fate.

The Swallows, which appeared here in such numbers on the 11th. of April, went away nearly as suddenly as they came; even up to the 18th., on which day the weather was equally fine and warm, scarcely one was

to be seen; since the 18th. a few more made their appearance, and on the 29th. we had them numerous as before. How is their absence from the 11th. to the 18th. to be accounted for? Was it from a deficiency of food causing them to return southward? Or were they an early detachment, and have proceeded further inland, and those following, new arrivals? We now see the swifts; their larger size, more sombre appearance, and greater rapidity of flight, is seen by an indifferent observer. Those who look with more interest will find great amusement in observing the difference in the motions of the two species. The flights of the Swifts are longer in the same direction, their bodies seem to be floating in liquid air without assistance of their extended wings, the motion of which is a graceful dipping on either side. The evolutions of the other species are more eccentric, with quicker action of wing, and as they wheel round you, alternately presenting their white and dark plumage.

Our friends, the Rooks, since they have accomplished their building operations, have been going on more orderly during the period of incubation. A portion resort to the fields to collect food for their young, and soon as provided return to their nests. They do not caw, for their mouths are too full; frequently one will pass near enough to enable you to observe his pouch as it hangs suspended, like a wallet, under his lower mandible, full of worms and grubs. The young will soon be issuing from their nests, when they are called "perchers," and their appearance is the signal for the beginning of the "Rook-shooting."

(*To be continued.*)

OUR FEATHERED FRIENDS.

BY O. S. ROUND, ESQ.

"WHAT is a friend? a thing so seldom known,
Yet so familiar an acquaintance grown;
We hear its name at every turn we make,
We must do this or that for friendship's sake.
Vile mockery of a word, whose sacred tie
And spotless name, in no mean compass lie!"

How common a saying is it in every man's mouth, "Oh! a *friend* of mine;" say rather one whom you are acquainted with to speak to, for this generally is the utmost meaning. Friendship depends somewhat on both parties, and the scarcity of true friendship is proved in this, that the least clashing of interest commonly severs the tie, firm as it may be supposed to have been, at once. Some people make friends quickly, and as quickly lose them; others are reserved and have few intimates, but their predilections when once indulged are strong and hasty; others seem antagonistic by nature to all their fellows—modern Ishmaels. I think I

may say, among a numerous acquaintance, I have some real friends; perhaps every one so circumstanced will say the same; but I like besides to have friendships which are, to a certain extent, of my own making, and upon which I can somewhat more experimentalize; I mean with the dumb creation. Among these, irrational as they are, it is by no means impossible or even difficult to induce a sympathy of feeling.

It is admitted that there are many animals which have an intelligence closely bordering upon reason, and there is no doubt that every living creature, even down to the zoophyte, has some sort of perception, for the *Polype* will not fail to withdraw his feelers on the approach of danger. "The ass knoweth his owner, and the ox his master's crib;" and I remember hearing it said that an old man in our village, (Sunninghill,) if his bees got wet, would dry them gently, by rolling them between the folds of a clean cloth. Now, perhaps of all pet creatures, birds are best known to us, and I am sure scarcely one of my readers will fail to call to mind the welcome note which greeted him as he descended to the parlour in the morning. Why should not a bird be as capable of likes and dislikes as a dog or a horse? It will be said that these are gifted with superior intelligence: are you sure of that? They shew it more, but may not that be more in shew than reality; that is, may not birds have as acute perceptions and strong instincts, though they do not exhibit it in their looks. Here they have a difficulty, for although the ruffled plumes and erected crest are indicative of disturbance of some kind, we cannot see the play of the muscles as we can in animals which have no such feathery clothing. But at least in the one instinct of constructing a habitation, they are far superior to all animals, the beaver excepted.

The most important object of their lives, and that which nature has lavished all her gifts upon, is the reproduction of the species; and hence we find in every animal, that this object calls forth unwonted and extraordinary qualities; the timid become bold, the savage gentle, the wild tame; and animals which are apparently gifted with less intelligence than others, display the most astonishing mechanical skill; look even at the insect tribes, and at their wonderful "baby-houses," and yet it is very common to deny them even the smallest perceptions; but here is a great mistake. We even read of a poor prisoner who made friends of the very spiders that spun their webs around his dungeon; and shall we then deny to birds as great a capability of sympathy as these? It were preposterous to deny it; go to our invaluable friend Mr. Kidd, and ask him, and see what a shower of feathery eloquence you will call down; aye, and not mere eloquence neither, for he talks and writes to purpose, and has, as he ought to have, I am sure, a great contempt for those who are disposed to use that epithet towards such pursuits as ours.

I pity from my soul a man who can either look on a bird merely as a specimen, a dish, or an animal. It is like ourselves, but in many respects how superior; a beautiful work of God's creation, aye, most beautiful. I ask but a calm review of the subject to confirm what I say. I know I run the risk of being thought morbid in this matter. I am content to be so regarded; but the disgust with which my constant contact with the world inspires me for everything human, renders it a positive feast to be able to turn to something which has even so negative a quality as mere harmlessness. I go from a crowd of pollution and iniquity, and find myself watching a pretty pair of my feathered friends, chirping in connubial harmony, and tending their callow brood. The contrast, so greatly unfavourable to humanity, that I fear I shall run my head against a wall, to shut out the filthy picture that I must return to. The sage has said, "Go to the ant, thou sluggard." I say, go to the woods, thou grovelling sensualist, and see, if thou canst, the beauty, the happiness of its tenants, and loathe thyself.

Richmond Terrace, Westbourne Grove, July, 1858.

Entomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 208.)

24. *H. nictitans*.—Common at sugar. and occasionally flying in the sunshine. Variable.

24.* *N. typha*.—Occurs rarely at Thornham. (B.)

N.B.—I met with seven or eight pupæ, and two or three full-fed larvæ last week, July 20th., at Stowmarket, in the stem of *Typha latifolia*. It is not however common in this neighbourhood. I have noticed that though the larva feeds indiscriminately upon those plants that have flowers, and those that have not, and will sometimes completely hollow out the flower-stalk; it almost invariably forms its cocoon in a plant without a flower. The pupa must be kept very moist, or you will not breed the perfect insect. It is best, if possible, to cut off the stem with the pupa in it, but if it slips out, as it is very likely to do, the best plan is to lay it upon some damp earth, in a tolerably close-fitting tin box. I have seen the pupa so low down in the

stalk, as to be partially submerged in the water. The perfect insect should always, if possible, be stuffed, as it is more subject to grease than perhaps any other moth, and will undergo numberless immersions in *turpentine* and *magnesia* without being cleansed. (C.)

25. *H. micacea*.—Common at light.

N.B.—This insect I have also taken in the hot sunshine at light, and at sugar. It is a most variable insect in size. The females are sometimes gigantic. (C.)

26. *A. putris*.—Very abundant in the pupa state at roots of various trees. Comes freely to light.

N.B.—This larva is very partial to the leaves of the potatoe. It is also very fond of the leaves of *Lamium album*, (the common white dead nettle,) and the stinging nettle, (*Urtica dioica*.) Its pupa becomes a pest to the digger. Though found under trees, I will venture to say it never feeds upon them, but upon the low plants round the stem. (C.)

27. *X. lithoxylea*.—Very abundant.

28. *X. polyodon*.—Very abundant.

29. *X. rurea*.—Common.

30. *X. hepatica*.—Very common on nettles and at light. In addition to the description of the larva in the "Manual," I may remark that it has a pinkish tinge, and is covered with small black tubercles. I frequently found it under moss on poplars. The insect was a pest at sugar; it, *Pronuba*, and *Polyodon* constantly engaging in desperate single combats, until overcome by their feelings (a combination of rum, sugar, and excitement) all fell helplessly on the ground.

N.B.—This larva frequently comes to the sugar in the early spring. I have seen it feasting away four or five feet from the ground. It may also be found by lantern-light crawling up to feed on the blades of young grass. (C.)

31. *X. scolopacina*.—To my surprise (having supposed it exclusively a "northern") I beat five fine specimens of this insect from oaks bordering a small plantation near Kesgrave Hall.

32. *D. pinastri*.—Local. I did not meet with it at Brandeston, but took fine specimens off sugar at Playford.

N.B.—Taken at Creeting Hills, but rarely. (B.)

This insect is partial to light. (C.)

33. *N. saponariae*.—Very uncommon. One wasted specimen at light.

N.B.—Taken rarely in woods near Stowmarket. (B.)

34. *H. popularis*.—Also rare. At light.

N.B.—The male is not uncommon at light, but if not caught immediately, soon dashes himself to pieces. The female appears to be one of our most uncommon insects, probably from her being sluggish and seldom flying. (C.)

35. *C. graminis*.—Taken at Woolpit wood, near Stowmarket. Not common. (B.)

36. *Cerigo cytherea*.—I generally have taken one or two specimens of this insect annually. Last year (1857) it came to sugar not uncommonly. (B.)

N.B.—I took this insect two or three times at light last year, 1857. (C.)

37. *L. testacea*.—Not common. At light and occasionally beaten.

N.B.—Common at light. (C.)

38. *L. cespitis*.—I took one fine specimen at light in September.

39. *M. anceps*.—Very common. Is very fond of the flowers of the raspberry. Varies much in the intensity of its colouring.

40. *M. brassicæ*.—Very abundant, of course.

41. *M. persicariæ*.—Also very plentiful. The larva will feed on anything and everything. It has been questioned whether it feeds on trees, but I have once or twice beaten it from oak, and in confinement it eats indifferently anything nearest at hand. It is a handsome insect when bred.

N.B.—No practical entomologist can doubt that this insect feeds upon trees. Elder is its favourite food. (B.)

I have frequently taken this larva on elder, and sometimes upon white thorn, but not upon any other tree. It is very variable in colour, sometimes bright green, sometimes dirty olive, and at others fulvous. The pupa closely resembles that of *H. pisi*. (C.)

42. *A. basilinea*.—Abundant.

43. *A. gemina*.—Common at raspberry blossoms, and light. I found it much more constant in its colouring in Suffolk than in Gloucestershire. In this latter county the varieties were so numerous, as to make it difficult for a tyro to determine the species.

44. *A. unanimitis*.—Tolerably plentiful in the larva state, under moss and loose bark on willows bordering upon streams. As I find from the "Manual" that it feeds upon various grasses, I suppose it merely chose this locality as a convenient place for becoming a pupa.

N.B.—I have taken this larva feeding upon water-grasses, in September and October. It most closely resembles that of *L. impura*, and were they found at the same time, might easily be confounded with it. It as frequently passes the winter in a loose earthen cocoon, as under moss or loose bark, and may be raked up at the sides of ditches, rivers, and canals, in the autumn and winter. I kept some alive all through last winter, in a tin box covered with gauze, and half filled with earth, outside my window. They buried some depth, and formed slight cocoons. In March they came up to the top, and spun slight webs between the folds of the gauze, where they turned to pupæ. They never fed in the spring. (C.)

45. *A. oculea*.—Very common.

46. *M. strigilis*.—Abundant at sugar, including every conceivable variety. I also bred it. The larva is grassy green, very much pointed at each extremity, and feeds inside the stems of grasses.

47. *M. fasciuncula*.—Common at sugar.

48. *M. literosa*.—Common at sugar.

N.B.—I do not find this insect common in my neighbourhood. (B.)

I have met with this insect both in Suffolk and elsewhere at sugar, but always very sparingly, and I consider it by no means common. (C.)

49. *M. furuncula*.—Common at sugar.

N.B.—This pretty little moth is very fond of flying in the hot sunshine, but is so active when it gets into the net, that it is difficult to box. (C.)

50. *M. arcuosa*.—Once taken at light.

N.B.—This insect is common in Derbyshire, flying just before twilight, over

the low damp meadows. The female appears when the males are getting wasted, and is a smaller and very differently marked insect. She is very sluggish, and remains, unless stirred up, amongst the stems of the long grass and other such herbage. I never saw the insect in Suffolk. (C.)

51. *G. trilinea*.—Very common at light and sugar. Since coming into Derbyshire, I have taken two remarkably fine specimens of the variety *Bilinea*, but did not meet with it in Suffolk.

N.B.—The variety termed *Bilinea*, of Haworth, is taken commonly with the light variety in Combs Wood, near Stowmarket, at sugar, in June. (B.)

52. *C. morpheus*.—This, I believe, uncommon insect, was plentiful at Brandeston, coming to light. It occurred also, but much more rarely, at Playford.

N.B.—This is a common insect in the neighbourhood of Stowmarket. (B.)

53. *C. alsines*.—Common at light.

N.B.—Occurs but sparingly at Stowmarket, in July. (C.)

54. *C. Blanda*.—Common at light.

55. *C. cubicularis*.—Common at light.

56. *R. tenebrosa*.—Very common at light, that is, the male; I only once met with the female, and that by beating.

N.B.—I have seen the female at sugar in tolerable plenty in Hants. and Bucks. She is a very difficult insect to box, jumping off as soon as ever the lantern appears, and when boxed ceaselessly banging about, to the utter destruction of her plumage. (C.)

57. *A. puta*.—Occurs but rarely in the neighbourhood of Stowmarket. (B.)

58. *A. suffusa*.—Not at all common. On nettles.

N.B.—Very common at sugar in the neighbourhood of Stowmarket. (B.)

59. *A. segetum*.—Grevously abundant at sugar.

60. *A. exclamatoris*.—Grevously abundant at sugar. When I was in Gloucestershire, a large high bank was being unsodded. The pupæ of these two species occurred there in almost incredible numbers. The labourers knowing that I was a "flycatcher," used to bring them to me by sixes and sevens, and I thus secured some beautiful varieties.

61. *A. corticea*.—I took splendid specimens of this insect at light. It is very obstreperous in a room, and has a fatal penchant for the light.

N.B.—Occurs but sparingly at sugar, in the neighbourhood of Stowmarket. (C.)

62. *A. nigricans*.—Extremely common at sugar.

N.B.—I have taken this insect during the last fortnight, (July 27th.,) on the flowers of the lime and sweet chesnut. (C.)

63. *A. tritici*.—Extremely common at sugar.

N.B.—On flowers of lime and sweet chesnut at Stowmarket. (C.)

64. *A. aquilina*.—Common at sugar at Brandeston, but not found at all at Playford. I should not have given this species thus confidently, being wholly unable to distinguish it myself, had I not taken up a boxful to London, mixed with *Tritici*, etc. At a meeting of the Entomological Society, Mr. Bond kindly pointed out the *Aquilinas*.

N.B.—On lime flowers and sweet chesnut. The latter tree is, I find, a capital bait for *Noctuæ*. They swarm over the blossoms, and soon get intoxicated, and upon a slight touch fall to the ground. (C.)

65. *A. agathina*.—There are three specimens of this insect in my collection, taken in the neighbourhood of Stowmarket. (B.)

66. *A. præcox*.—Taken by Mr. Levitt, of Finborough; one at Bury St. Edmonds, the other in the grounds of R. Petteward, Esq. I never met with it during my residence at Stowmarket, and always thought it an exclusively coast insect. (B.)

N.B.—A single specimen was taken at sugar a few years since, by Mr. W. Baker, at Coombs Ford, near Stowmarket. (C.)

(To be continued.)

INSECTS NEW TO THE SUFFOLK LIST.

BY THE REV. H. HARPUR CREWE, M.A.

T. formicæforme.—A correspondent informs me that he has taken this insect pretty freely in the neighbourhood of Stoke-by-Nayland.

P. chrysorrhæa, (Brown Tail).—I have both taken and bred this insect from the larva in the neighbourhood of Stowmarket during the present season. My friend Mr. J. Longe also took the larva, and myself the perfect insect, at Felixstow.

M. abjecta.—Mr. H. Bree and I took this insect at sugar on the coast at the end of July and the beginning of August.

A. saucia.—Mr. Bree and I took a single specimen of this insect at sugar on the coast, July 30th.

H. suasa.—Taken at sugar on the coast with the preceding.

H. dipsacea.—Mr. H. Bree took a single specimen on the coast the first week in August. I saw another a few days previously, flying over the beach in the hot sunshine, but unfortunately missed it.

Stowmarket, August 9th., 1858.

STAY AT HOME.

BY THE REV. H. HARPUR CREWE, M.A.

ENTOMOLOGISTS as a body are an erratic race. They are always apt to think that they can catch better things at a distance than at home. I do not for one moment pretend to be one bit better than my neighbours in this respect, but still I am quite sure we often miss very good things at home, while wandering on what frequently turns out to be a wild-goose chase after imaginary rarities at a distance. It may interest some of the readers of "The Naturalist" to read a list of insects not quite so common as to be a pest, which I have taken in years gone by within the boundaries of my father's Rectory grounds in Derbyshire. Those marked (p) I have also taken in the parish.

1. *P. statices*.—(p.)

2. *S. ocellatus*.—The eggs and larvæ common on the apple trees in the orchard.

3. *S. convolvuli*.—Hovering over the flowers of the 'Marvel of Peru.'
4. *C. elpenor*.—Over flowers of rhododendron.
5. *C. porcellus*.—Flowers of honeysuckle.
6. *M. stellatarum*.—Flowers of jessamine.
7. *S. bembiciformis*.—Larva in willow stump, (p.)
8. *H. sylvinus*.—Flying over grass at twilight.
9. *H. hectus*.—Over heath, (p.)
10. *C. ligniperda*.—In old willows.
11. *C. fuscula*.—Eggs and larvæ on willow and willow.
12. *C. bifida*.—Eggs and larvæ on various kinds of poplar.
13. *C. dromedarius*.—Larva on birch and alder.
14. *D. ziczac*.—Larva on poplar.
15. *N. dictæa*.—Larva on poplar.
16. *N. dictæoides*.—Larva on birch close to the windows. The perfect insect at light at my bed-room window.
17. *N. camelina*.—Larva very common on various trees.
18. *P. palpina*.—Eggs and larvæ on poplar.
19. *P. pudibunda*.—The perfect insect once, and the larva once. This moth is very uncommon in Derbyshire.
20. *C. Jacobæa*.—Larva on ragwort, but rare, (p.)
21. *P. fuliginosa*.—Larva on various low plants.
22. *E. lanestris*.—Very common.
23. *P. populi*.—Larva on various trees, (p.)
24. *T. cratægi*.—Larva on whitethorn.
25. *S. pavonia-minor*.—Cocoon on heath, (p.)
26. *P. fulcula*.—Larva on birch and alder: common.
27. *T. darsa*.—At sugar.
28. *T. batis*.—At sugar.
29. *C. duplaris*.—Larva on birch, (p.)
30. *C. flavicornis*.—Larva on birch, (p.)
31. *B. perla*.—At light, and on the stable walls.
32. *A. tridens*.—Larva on whitethorn and plum.
33. *A. leporina*.—Larva on poplar.
34. *A. megacephala*.—Larva on poplar.
35. *A. alni*.—Larva on black Italian poplar, (p.)
36. *A. rumicis*.—Larva common on dock and sorrel.
37. *S. comma*.—Common, flying over the long mowing grass and flowers of rhododendron.
38. *N. typha*.—Larva in stems of *T. latifolia*, (p.)
39. *N. micacea*.—At light.
40. *N. saponaria*.—At sugar.
41. *H. popularis*.—At light.
42. *L. testacea*.—At light.
43. *A. unanimitis*.—Larva on water-grasses in August and September.
44. *M. literosa*.—At sugar.
45. *M. arcuosa*.—Common, flying over the grass at twilight.
46. *C. morpheus*.—At light.

47. *C. blanda*.—At light.
48. *A. porphyraea*.—Larva on heath, (p.)
49. *T. interjecta*.—Flying along the hedges just before twilight.
50. *T. janthnai*.—Beaten from whitethorn hedges in the day-time: common.
51. *N. C-nigrum*.—At sugar.
52. *N. triangulum*.—At sugar.
53. *N. bella*.—At light.
54. *N. umbrosa*.—At sugar, and flying over flowers.
55. *N. baja*.—At sugar, and flying over flowers.
56. *T. piniperda*.—Larva on Scotch fir.
57. *O. lota*.—At sugar.
58. *O. macilenta*.—At sugar.
59. *A. rufina*.—At sugar.
60. *O. litura*.—At sugar.
61. *X. cerago*.—Beaten from birch, (p.)
62. *X. flavago*.—Beaten from birch, (p.)
63. *X. gilvago*.—At sugar.
64. *T. subtusa*.—Larva on poplar.
65. *C. affinis*.—Beaten from elm.
66. *D. carpophaga*.—Larva on *S. inflata* and *L. dioica*.
67. *D. capsicola*.—Larva on *S. inflata* and *L. dioica*.
68. *D. cucubali*.—Larva on *S. inflata*.
69. *D. conspersa*.—Larva once on *L. dioica*.
70. *P. chi*.—At sugar, on walls; larva on lettuce.
71. *A. aprilina*.—Sugar.
72. *E. lucipara*.—Sugar. Larva on potatoe.
73. *A. nebulosa*.—At sugar.
74. *H. protea*.—At sugar.
75. *H. dentina*.—Rhododendron flowers.
76. *M. pisi*.—Larvæ, (p.)
77. *X. lithorhiza*.—Larva on snow-berry.
78. *C. vetusta*.—At sugar.
79. *C. exoleta*.—Larva on *S. salicifolia*.
80. *C. verbasci*.—Larva on *V. thapsus*.
81. *C. umbratica*.—Honeysuckle flowers.
82. *A. myrtilli*.—Larva and perfect insect on heath, (p.)
83. *A. urticae*.—Larva common on nettle.
84. *A. triplasia*.—Perfect insect flying over flowers.
85. *P. festuca*.—Once flying over flowers in the garden.
86. *P. iota*.—Common.
87. *P. pulchra*.—Not uncommon on flowers of honeysuckle and the orange lily.
88. *M. typica*.—Larva very common on dock and sorrel.
89. *M. maura*.—At sugar.
90. *P. enea*.—Heath, (p.)
91. *O. sambucaria*.—Abundant.
92. *E. apiciaria*.—Larva on willow, (p.)

93. *M. margaritarea*.—Very common.
94. *P. syringaria*.—Occasionally flying in the shrubberies.
95. *S. illunaria*.—Abundant.
96. *S. lunaria*.—Larva on elm and hazel.
97. *O. bidentata*.—Abundant, both larva and perfect insect.
98. *C. elinguarina*.—Abundant, both larva and perfect insect.
99. *E. tiliaria*.—Larva on willow.
100. *H. pennaria*.—Larva common.
101. *P. pilosaria*.—Abundant, larva and pupa.
102. *A. betularia*.—Abundant, larva and pupa.
103. *H. abruptaria*.—Perfect insect flying in the garden in April and May.
Larva on rose in July.
104. *B. repandaria*.—Common.
105. *B. rhomboidaria*.—Common.
106. *G. papilionaria*.—Perfect insect at light, larva not uncommon when small on birch and alder in the shrubberies.
107. *T. lactearia*.—Common, larva and perfect insect.
108. *H. thymiaria*.—Common, larva and perfect insect.
109. *A. luteata*.—Not common, (p.)
110. *E. heparata*.—Larva and perfect insect common among alders, (p.)
111. *T. amataria*.—Not common.
112. *H. wavarina*.—Common among currant bushes.
113. *P. petraria*.—Common amongst heath and fern, (p.)
114. *N. pulveraria*.—Larva common on hazel.
115. *T. piniaria*.—Among Scotch firs.
116. *A. ulmata*.—Larva and perfect insect among elms, (p.)
117. *H. rupicaprarina*.—Abundant.
118. *H. Aurantiaria*.—Occasionally the larva.
119. *H. progemmaria*.—Abundant.
120. *H. defoliaria*.—Abundant.
121. *A. æscularia*.—Larva on oak and elm.
122. *O. dilutata*.—Abundant.
123. *L. didymata*.—Abundant.
124. *L. pectinitaria*.—Not uncommon.
125. *E. affinitata*.—At light.
126. *E. albulata*.—Flying over low meadows, (p.)
127. *E. decolorata*.—Not uncommon.
128. *E. verosata*.—Larva on seeds of *Silene inflata* and *Lychnis dioica*.
129. *E. succentuiata*, (*subfulvata*.)—Flying, and at light.
130. *E. castigata*.—Common.
131. *E. denotata*.—Larva on *Pimpinella saxifraga* in September.
132. *E. nanata*.—Larva and perfect insect on *Calluna vulgaris*, (p.)
133. *E. subnotata*.—Perfect insect beaten from whitethorn hedge.
134. *E. vulgata*.—Perfect insect beaten from whitethorn hedge.
135. *E. absinthiata*.—Larva common on *Senecio Jacobæa*, August to October, (p.)
136. *E. minutata*.—Larva on *Calluna vulgaris*, September, (p.)

137. *E. abbreviata*.—Larva on oak, June and July, (p.)
138. *E. exigua*.—Not common.
139. *E. sonibrinata*.—Larva common on juniper in the garden in May.
Perfect insect at light, August.
140. *E. rectangulata*.—Perfect insect in the garden.
141. *T. simulata*.—Larva on Scotch fir, (p.)
142. *T. firmata*.—Larva on Scotch fir, (p.)
143. *Y. impluviata*.—Larva on alder.
144. *M. rubiginata*.—Common, larva on alder.
145. *M. ocellata*.—Common, larva on *Galium verum*, (p.)
146. *M. albicellata*.—Scarce, perfect insect.
147. *A. badiata*.—Common, larva on petals of rose.
148. *A. derivata*.—Common, larva on petals of rose.
149. *S. dubitata*.—Common on flowers of heath in the garden.
150. *C. miata*.—Not common.
151. *C. corylata*.—Common.
152. *C. suffumata*.—Not uncommon.
153. *C. prunata*.—Not uncommon.
154. *C. testata*.—On heath, (p.)
155. *C. populata*.—On heath, (p.)
156. *C. fulvata*.—Swarms everywhere.
157. *C. dotata*.—Occasionally in the kitchen garden.
158. *P. comitata*.—Scarce, at light.
159. *E. cervinaria*.—Larva on hollyhock in the garden.
160. *E. mensuraria*.—Not uncommon, (p.)
161. *A. plagiaria*.—Not common, (p.)
162. *T. chærophyllaria*.—Not uncommon in low meadows, (p.)

All these insects not marked (p.) occur in the garden and close to the house. I do not for one moment pretend that this is by any means a perfect list, as since I began regularly to collect, my visits to Derbyshire have, from necessary duties, been, comparatively speaking, few and far between, and I have by no means worked the locality thoroughly. All the common *Pyrales* are abundant, and *H. stratiotalis* frequent at light; by this means I have also taken *P. glaucinalis* and Dr. Hagan's new insect *Acentropus niveus*.

Stowmarket, August 10th., 1858.

On the variation of species.—A discussion has been going on in the Entomological Society, about the possibility of different kinds of food and other circumstances, so altering the appearance of the larvæ of lepidoptera, as to give them the character of permanent species. Mr. Westwood has taken the affirmative of this view with regard to the larvæ of the small leaf-miners, figured in Stainton's last volume of the "Natural History of the Tineina." I confess to having formed the same opinion as Mr. Westwood, when I saw those figures, and I do not think his remarks have been properly met. His statement, as far as I could gather it, was that he considered that the assumed

specific difference between some of the species in the larva state, for there is no appreciable or permanent distinction in the perfect insect, was occasioned by difference of food; that is, a larva mining birch, might present a totally different aspect to one mining hazel. Upon this Mr. Westwood has been charged with holding the views of the transcendental or development school. Surely there never was a more absurd charge made than this. Without entering into the question of development, or maintaining for a moment views which I believe have no philosophical basis, I may remark in passing, that such a charge, so made, is a distinct proof that the principles of the school thus impugned, have not been understood in this discussion. Now with regard to the question at issue. Will Mr. Stainton, or any other person who has professed to study species, or who may have observed that the habits of those larvæ are different, be kind enough to lay down in clear and unmistakeable language, what are the differences of structure or habit upon which the determinations of these species are effected. It will not do to tell us that they are different in colour, because this is clearly to be accounted for in the different colouring properties of leaves; for assuming that *Chlorophylle* is alike in chemical composition and colour in different plants, provided its specific gravity is the same, no one will doubt that its colouring properties vary in leaves of different plants. Thus supposing it were more inspissated in a given quantity of beech leaf than in the same quantity of hazel, the colouring powers would be greater in the former than the latter. *A. fortiori*.—This would be still stronger if in addition the parenchyma of the plant were more condensed, and this is exactly the condition which obtains between the beech and the hazel leaf. It appears manifestly absurd to suppose that if the larva found it more easy to mine the upper than the under part of the leaf, or to make a blotch rather than mine at all, it were to be constituted a different species. I hope Mr. Westwood and others equally capable, will make a stand against this modern system of making species from unimportant data. As Mr. Westwood justly observed, were there any organic difference either in the larva or imago, there would be good grounds, and not otherwise, for constituting these insects in all essential particulars so exactly the same, into different species. I also hope that they will not be induced to give way by the disingenuous mode of argument, which assumes that men anxious for the real progress of science, must necessarily maintain the manifest absurdity that “the difference of habit was the cause of the modification of the species.”—ED.

On so-called Showers of Insects.—The English people are not alone in their credulity about what are called “showers of insects or frogs.” The readers of the “Gardeners’ Chronicle” may remember some years ago, that one of the gardeners at Osborne published an account of what he called a shower of snails, and he was very angry with the writer of this notice, who presumed to account for the phenomenon upon grounds purely natural. The good people of Warsaw have had their shower this year, much to their wonder and surprise. Professor Waga has, however, in an excellent though somewhat long article in the “Revue de Zoologie,” for June, also accounted for their

appearance in a most satisfactory manner. The "shower" in the present case was that of larvæ, which M. Waga, who saw them, recognised as those of one of the Coleoptera—*Cantharis fusca*, of Linnæus. They were found in great numbers crawling upon the snow, or congealed in the ice, on the 20th. of January. There had been severe weather, followed by a rise of the temperature, with rain, and then frost again on the night of the 19th. The people believed they had fallen with the rain. M. Waga cites four instances of similar phenomena having occurred, at Leufsta, in Sweden, in January, 1749; at Anspach, January 14th., 1806; at Noethen, on the Rhine, January 30th., 1847; and at Prosopow, in Lithuania, on the 24th. of January, 1849. In all these instances the larvæ were those of *C. fusca*, and the period, within fourteen days the same. Supposing these phenomena to have been produced by a water-spout, the only explanation possible, had they fallen with the rain, we have, as M. Waga remarks, the extraordinary coincidence of five water-spouts occurring in the latter half of the month of January, each time finding a swarm of larvæ ready to be transported. According to the new and generally received theory of Peltier, these water-spouts are produced by the junction of two opposite electric conditions—negative in the atmosphere, and positive in the earth—which conditions only occur during great heat. Besides it is self-evident, that if the larvæ had been transported by a water-spout, their appearance above ground in the middle of winter has still to be accounted for, as they do not, like the snow insects *Podura nivalis*, make their appearance at that time as a *natural law*. The explanation given by M. Waga is simply this:—The larvæ of *C. fusca* hybernate, but do not bury in the ground. In the autumn they feed among dead leaves and herbage, principally upon spiders, and they go to their winter rest in those localities, being provided by nature with a velvety coat, which protects them equally from severe cold and excessive wet. When the temperature suddenly rose, as it did on this 19th. of January, they were roused from their torpidity, and crawled out upon the snow, where they were again caught by the frost of the succeeding night, which either congealed them in the ice, or prevented them getting back to their dead leaves, before they were discovered by the good people of Warsaw.—ED.

Synia musculosa.—On the 10th. of August I had the good fortune to capture a female specimen of the above rare and beautiful insect; a friend with me the same evening took two others, male and female; the same friend a few days before took a female specimen of *Pieris daphidice*; another person here on the 5th. instant also took this insect, which I saw alive.—T. THORNCROFT, Brighton, August 18th., 1858.

N. senex.—I was not acquainted with the habits of this little insect till the other day. Happening to go down one evening (July 14th.) to a marsh near here, I noticed a small pale moth, which I took to be a *Crambus*, flying over the tops of the rushes at twilight. I at once caught it, and found it to be *N. senex*. On that and two or three other evenings, I took twenty or thirty. The female seems to be sluggish, for I only took two.—H. H. CREWE, Stowmarket, August 9th., 1858.

P. palpina.—I took a male of this insect at light, August 6th. Mr. J. King took another, August 1st. This looks like a second brood.—Idem.

E. denotata.—I have been fortunate enough to breed seven specimens of this pretty Pug during the present season. The larvæ, which are green, or dusky purple, with a broad dorsal stripe of the latter colour, feed on *Pimpinella saxifraga* in September. I took them both in Derbyshire and Suffolk.—Idem.

C. spartiaria.—I bred two fine specimens of this insect, July 16th. and 23rd., from larvæ taken at the end of May. The rest shew no signs of coming out. Last year all the pupæ remained quiescent till September and October, the usual time for the appearance of the perfect insect.—Idem.

S. convolvuli.—I regret to say that all my eggs of this insect prove to be infertile.—Idem.

Tenacity of life in S. rhamnaria and vetularia.—On the evening of July 3rd. I took ten fine specimens of each of these insects. I gave them a good dose of ammonia for a couple of hours; and then as the following day was Sunday, and I was too tired to set them that night, put them into the relaxing box till Monday morning. The next day, before I went to church, I just looked into the box, and found them perfectly motionless, and apparently quite dead. On my return home in the evening I again looked in, when to my horror I found three or four of each species had come to life, and utterly ruined themselves and the majority of their companions by flapping about.—Idem.

Colias edusa.—I have taken several specimens of this insect, which I believe has been frequently seen this year, but never before during the time that I have been collecting, (ten years,) have I seen one. I also took a fine specimen of the Convolvulus Hawk Moth a few evenings since. Is not this rather early for its appearance?—W. H. TUCK, Tostock House, near Woolpit, Suffolk, Aug. 23rd., 1858.

On Monday, the 23rd. of this month, a specimen of *Colias edusa* was captured by my brother, H. W. Alington, Esq., in the parish of Welton-le-Wold, near Louth; there was another in company with it.—R. P. ALINGTON, Swinhope Rectory, August 27th., 1858.

The present appears a good year for this species. Three were seen at once in the parish of Warter, near here, and one was seen in the parish of North Dalton, by Miss Rose Morris, on the 2nd. of September. I received a specimen from Fimber, near Driffeld, from Mr. Mortimer, of that place, where two others have since been taken by him; and another from Lincolnshire, sent by the Rev. Edward Alington Cooper, taken by him on "The Slates," the highest point of the Lincolnshire Wolds. Mr. Graham, of York, also took four in Hcslington Fields, near York, where others were taken.—F. O. MORRIS.

This morning, driving over the Wolds to Driffeld, I saw nine by the roadside, and captured three of them.—F. O. MORRIS, September 13th., 1858.

I beg to record the following captures of *Colias edusa*:—On the 7th. ult. I took a fine male specimen in a market garden here, and the next day a female in equally fine condition, at Woodford-Bridge, in Essex. I may also mention that two more have been since seen by an entomological friend in his garden at Dalston.—ARTHUR E. BIGGS, South Hackney, September, 1858.

The *Colias edusa* has again appeared in our neighbourhood. Last week I took six, and saw several more.—W. G. GIBSON, Dumfries, September 1st., 1858.

Acherontia atropos.—It may be interesting to the northern subscribers of "The Naturalist," to learn that three caterpillars of the Death's Head Hawk Moth, (*Acherontia atropos*,) have lately been taken in the neighbourhood of Beverley, Yorkshire; one at Grovehill, and two at Leckonfield.—CHARLES WILLIAMSON, "Beverley Express" Office, August 18th., 1858.

I had several larvæ of *Acherontia atropos*, I believe fourteen, some eight or nine years ago from Barmston, near Beverley, two of which I succeeded in rearing, and they are now in my collection. The present would also appear to be a "good year" for the species. Calling at Hutton Lodge, near Malton, some weeks ago, I was asked if I could tell the name of a wonderful caterpillar the gardener had got. From the description I guessed it to be that of the Death's Head Moth, and such it proved. It had been found by a woman at the village of Low Hutton. She "took it up with a *tengs*, and put it into an old tea-kettle." When I saw it it was on a board, under a bell-glass. I saw that it probably wanted to go into chrysalis, as it appeared full-fed; and as it was readily given to me, I brought it home, when it at once went under the ground.—F. O. MORRIS.

A. alni.—Had the Rev. J. Greene been acquainted with the following facts concerning this species, I think in his remarks at page 207 he would have given York honourable mention as one of its best localities. I will give the following statements in support of this assertion:—In 1856 a larva of this species feeding on the willow, was taken in the Museum Gardens by Mr. Brown, which he succeeded in rearing the following year. On the 16th. of August, 1857, I was equally fortunate in taking another, in our garden, which fed on lime, from the pupa of which, on the 30th. of last May, emerged a beautiful specimen of this rare insect. On the 13th. ult. Mr. Prest found a fine larva, which went *down* a few days afterwards, and on the 29th. ult. Mr. Robinson obtained a larva, which was found on a blade of grass, the only trees near it consisting of oak and the common nut. Mr. Allis has also met with this species near York. I may here remark that although the "Manual" states that all the *Acronycta* larvæ spin cocoons, such was not the case with any of those which I now record, all the pupæ being *on* or *under* the earth, without the least appearance of a cocoon.—ROBERT ANDERSON, Coney Street, York, September 2nd., 1858.

Apatura iris.—My brother took a fine male specimen of *A. iris* on a small oak tree, quite a mile from Combs Wood, where we have seen about a dozen this year. Mr. Bull and Mr. Joseph King took five male and two

female specimens at Combs Wood. I had not the good fortune to take a single specimen there, (it requires a great length of net,) though I was in company with them. We only saw three, (all females.) which came to the ground, two of them we succeeded in capturing.—ARTHUR L. SIMPSON, Stowmarket, August 4th., 1858.

Captures on the Suffolk Coast.—My brother writes me word that he is taking on the coast *Luperina abjecta*, *Heliothis dipsacca*, *Agrotis saucia*, *nigricans*, *tritici*, and *valligera*, *Colias edusa*, *Miana furuncula*, *Hydræcia nictitans*, etc.—C. R. BREE, August 7th., 1858.

THE ROBIN.

IN the winter of 1855-6, two little Robins came regularly to be fed in a garden situated in a small town in Hampshire. Early in the spring of 1856, they were seen constantly flying in and out of the porch of the garden door, and to the great delight of the younger members of the family, were found to be building their nest in a small watering-pot, which hung about four feet from the ground, and a foot from the door leading to the porch, which is formed of trellis-work entwined with jessamine, roses, and honeysuckle, and is the receptacle for the children's garden tools and playthings, being hung round with hoops, which are almost in daily use, and one of which was actually on the same nail with the watering-pot. This minute description is given to convey some idea of the constant passing to and fro there must be with a family of seven children, four of whom are boys.

The Robins hatched and reared a brood of five young ones, who all disappeared as soon as the old birds had taught them to fly, a process which was most interesting to watch, and which was most joyfully participated in by the children—one little girl stroking the young birds during the time. It was thought the nest might be too high for them to fly back to, so at dusk they were all carefully replaced, but this precaution proved useless, as they all hopped, or rather tumbled out again. Soon after, notwithstanding the watering-pot had frequently been moved, they re-lined the nest, and reared another brood of seven birds.

During each time of sitting, the parent bird came regularly at a certain time of the day to be fed. So much accustomed were they to little faces, and so tame had they become, that on several occasions when the watering-pot was taken down to exhibit the young ones to juvenile visitors, the parent birds might be seen in a laurel-bush close by, with worms, flies, etc., waiting their opportunity of coming to the nest, nothing daunted. Crumbs of bread placed on the watering-pot would immediately disappear,

and the old Robins would frequently remain perched on it, looking at the passers by.

It is a singular fact that these little Robins have continued regularly to visit the same spot, coming *inside the door* to be fed several times every day during the whole summer, frequently surrounded by five or six juveniles, all anxious to be first in feeding their pets.

In the beginning of February this year, the watering-pot which had been in use during the summer, was again hung on the same nail, and on the 11th. they commenced building, and a very snug little nest they have made; five eggs have been laid, and while I am writing this account the little bird is now sitting on them. She is often looked at during the day, which does not appear to cause her any alarm, and this winter they have frequently eaten from the hand.—*Church of England Sunday Scholars' Magazine.*

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 193.)

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| Sciurus pusillus, <i>Desm. Schinz. Macroxus pusillus, Less.</i> | Sciurus hypopyrrhus, <i>Wag. Schreb. Schinz.</i> |
| Sciurus annularis, <i>Schinz. S. annulatus, Desm. Less.</i> | Sciurus albipes, <i>Wag. Schreb. Schinz.</i> |
| Sciurus mustelinus, <i>Bachm. Schinz.</i> | Sciurus socialis, <i>Wag. Schinz.</i> |
| Sciurus ferruginei-ventris, <i>Bachm. Schinz.</i> | Sciurus stramineus, <i>Schinz.</i> |
| Sciurus mollipilosus, <i>Bachm. Schinz.</i> | Sciurus igniventer, <i>Natt. Schinz.</i> |
| Sciurus occidentalis, <i>Bachm. Schinz.</i> | Sciurus pyrrhonotus, <i>Natt. Schinz.</i> |
| Sciurus fusco variegatus, <i>Schinz. S. Richardsonii, Gray.</i> | Sciurus multicolor, <i>Rüpp. Schinz.</i> |
| Sciurus Colliæi, <i>Richardson. Schinz.</i> | Sciurus gambianus, <i>Rendall. Schinz.</i> |
| Sciurus Langsdorffii, <i>Brandt. Schinz.</i> | Sciurus erythropus, <i>Schinz. S. ginginianus, Shaw. S. albovittatus, Fisch.</i> |
| Sciurus variegatus, <i>Schinz.</i> | <i>S. dschinschicus, Linn. S. Levaillantii, Kuhl. S. setosus, Forst.</i> |
| Sciurus variegatoides, <i>Ogil. Schinz.</i> | Sciurus congieus, <i>Kuhl. Schinz.</i> |
| Sciurus æstuans, <i>Linn. Schinz. Myoxus Guerlingus, Shaw. Macroxus æstuans, Less.</i> | Sciurus pyrrhopus, <i>Schinz.</i> |
| Sciurus Belcheri, <i>Gray. Schinz.</i> | Sciurus Cepapi, <i>Smith. Schinz.</i> |
| Sciurus Richardsonii, <i>Schinz.</i> | Sciurus madagascariensis, <i>Shaw. Cuv. Desm. Buff. Fisch. Less. Schinz.</i> |
| Sciurus nigrescens, <i>Bennet. Schinz.</i> | Sciurus getulus, <i>Linn. Schreb. F. Cuv. Schinz.</i> |
| Sciurus dimidiatus, <i>Water. Schinz.</i> | Sciurus rutilus, <i>Rüpp. Schinz. S. brachyotus, Ehren.</i> |
| Sciurus variabilis, <i>Geoff. Schinz.</i> | Sciurus leucumbrinus, <i>Rüpp. Schinz.</i> |

- S. setosus*, Schreb. *S. ginginianus*, Griff.
Sciurus setosus, Schreb. Forst. Schinz.
S. Levallantii, Kuhl. *S. albovittatus*, Desm. *S. namaquensis*, Lich.
Macroxus albovittatus, Less.
Sciurus erythropus, Fr. Cuv. Geoff. Schreb. Schinz.
Sciurus prætextus, Wag. Schinz.
Sciurus ocellaris, Smith. Schinz.
Sciurus rubrobrachiatus, Water. Schinz.
Sciurus Stangeri, Water. Schinz.
Sciurus erythrogyne, Water. Schinz.
Sciurus philippensis, Water. Schinz.
Sciurus Rafflesii, Horsf. Schinz. *S. Prevostii*, Desm. Less.
Sciurus auriventer, Schinz. *S. hypoleucus*, Horsf. Geoff. Fisch.
Sciurus malabaricus, Schinz. *S. maximus*, Schreb. Horsf. *S. indicus*, Erzl. Desm. *S. bombayus*, Bodd.
Sciurus bicolor, Schinz. *S. Ceylonensis*, Bodd. Desm. Shaw. *S. macrourus*, Forst.
Sciurus Leschenaultii, Schinz. *S. javensis*, Shaw. *S. albiceps*, Des.
Sciurus pygerythrus, Geoff. Schinz.
Sciurus flavimanus, Geoff. Guerin. Schinz. *S. vittatus*, Raffl. *S. bivittatus*, Desm. Horsf.
Sciurus McClellandii, Horsf. Schinz.
Sciurus Lokriah, Hodg. Schinz.
Sciurus locrioides, Hodg. Schinz.
Sciurus hippurus, Geoff. Schinz.
Sciurus nigrovittatus, Horsf. Fisch. Schinz. *S. griseiventer*, Geoff.
Sciurus Plantani, Schinz. *S. notatus*, Bodd. *S. bilineatus*, Geoff. Desm. *Macroxus bivittatus*, Less.
Sciurus insignis, Horsf. F. Cuv. Geoff. Schinz. *Macroxus insignis*, Less. Fisch.
Sciurus Kerodrenii, Schinz. *S. Kerodrenii*, Less. *S. ferrugineus*, F. Cuv.
Sciurus palmarum, Horsf. Schreb. Desm. F. Cuv. Schinz. *Tamias palmarum*, Less.
Sciurus Elphinstonii, Sykes. Schinz.
Sciurus Finlaysonii, Schinz.
Sciurus redimitus, Schinz.
Sciurus Ephippium, Mull. Schinz.
Sciurus laticaudatus, Mull. Schinz.
Sciurus modestus, Mull. Schinz.
Sciurus melanotis, Mull. Schinz.
Sciurus exilis, Mull. Schinz.
Sciurus syriacus, Ehren. Schinz.
Sciurus sublineatus, Water. Schinz.
Sciurus Delessertii, Guerin. Schinz.
Sciurus caucasicus, Schinz. *S. erythraeus*, Fenn. *S. anomalus*, Gmel. Schreb. Pall.
Sciurus persicus, Gmel. Linn. Schinz. *S. vulgaris-persicus*, Erzl.
Sciurus affinis, Horsf. Raff. Fisch. Schinz.
Sciurus tenuis, Horsf. Schinz.

TAMIAS.

- Tamias quadrivittatus*, Schinz. *Sciurus quadrivittatus*, Harl. Rich. Fisch. Less.
Tamias uthensis, Schinz. *Sciurus uthensis*, Pall. Wag. Schreb.
Tamias striatus, Schinz. *T. striata*, Illig. *Sciurus striatus*, Linn.
Tamias Lysteri, Bach. Harl. Schinz. *T. Americana*, Kuhl. *Sciurus striatus-klein*, Pall. Schreb. *S. Lysteri*, Ray.
Tamias rubrolineatus, Schinz. *Sciurus rubrolineatus*, Desm. Ward.
Tamias minimus, Bach. Schinz.

(To be continued.)

Proceedings of Societies.

East Kent Natural History Society.—(Continued from p. 196.)—Hawking, that most noble of all sports,—and which, I am happy to say, is again rising in public estimation—shows the power we possess over birds, and the means at our disposal for training them. The glorious flight of a falcon towering far above us, then whirling with outstretched pinion, moving in most graceful eircles, and at the call of return swooping down with great rapidity, and almost unerringly striking as he passes the whirling lure—is a sight, once seen, never to be forgotten.

Time prevents my dilating any more on this interesting subject of birds; but before quitting it, I wish to impress one fact strongly upon you—that, although occasionally birds do us some injury, yet in the aggregate they are our best friends; therefore nothing can be more destructive to our land than killing them. During the breeding-season our common birds feed their young almost entirely upon insects; thus the pert and bold sparrow is at this time of the year a true and good friend to the cultivator and gardener, and yet, like many true friends in this world, is rewarded by having a price set upon his head, and doomed to general and uncondemned destruction, by parish authorities, as well as every idle, ragged urchin capable of climbing to its nest. Rooks are also made to suffer the penalties inflicted by ignorance; yet the myriads of caterpillars, slugs, and various insects consumed by a rookery is incalculable.

A connexion of mine, some years since, farming nearly two hundred acres, was prejudiced against these birds, doomed them to destruction, and by poison and other means reduced his large rookery to a very small number of birds. But a fearful retribution followed. The next year the larva of the cockchafer and other insects, abounded to that degree that his crops, in some places, were entirely destroyed. An intelligent friend having pointed out to him his great error, he quickly took as much pains to nurse his rookery, as he previously had done to destroy it. Fortunately the happy result of his present course, convinced him of the truth of his friend's advice.

I do not deny that birds occasionally do mischief, but the expense of frightening them off the land is very trifling compared with the ravages the insect world would commit, if not kept in some measure under by the birds during the breeding-season.

I have learnt with regret, that the practice of poisoning birds prevails to a great extent in this neighbourhood, and there is a magpie among the birds on the table which was killed in this manner. There is no doubt that the mixture used for the purpose contains strychnine, whose

poisonous effects are communicated to the body which it enters. When it is considered that some of the birds so killed are very likely to be eaten by poor persons, who may thereby be subjected to great danger, this matter becomes of importance, and I propose to refer to it more at length on a future occasion.

If ornithology offers inducements to the general, or partial observer of nature, to bestow some of his leisure hours in making acquaintance with its interesting details, what shall we say of entomology?

The different species of British birds amount to about thirty-five; whilst that of British insects to many thousands. Whether we look to the direct or indirect injuries they inflict on us, or the direct or indirect benefits they confer, their marvellous changes, beauty of colour, or singularity of form, under every point of view they appear to me to present such wonderful and speaking attractions, that I cannot conceive how it happens that its study has been, I may almost say, entirely neglected, or but very partially followed until the last few years.

When I returned to England, in 1830, from Brussels, where I had been to school, and was prepared to enter College life, I brought home a treasure far more dear to me than the metaphysical septicism of the present day—the love of truthful nature. Imagine my disappointment—which was great indeed—when my enthusiasm was only rewarded by the jeers and rebukes of relatives and friends, at what they deemed my waste of time over such inconsiderable things as insects and butterflies, instead of the warm welcome of approbation the impulses of youth had anticipated.

But the taste, once imbibed, could never again slumber, and perseverance brought with it its proselytes. I had the supreme delight of seeing on my return home, unexpectedly one day, my dear old parents panting and exhausted from chasing a gaudy, yet common butterfly, over the kitchen-garden. They were caught *flagrante delicto*; and you may easily conceive that from that moment I had won the victory, for they never again rebuked my pursuit, nor suffered others to do so.

I believe, if we could state the relative number of entomologists in 1830 and 1838, they would stand as one to a hundred.

With so much to study, and so few years for collecting facts, can it be surprising to you that no means have yet been discovered to destroy the blight on the hop, the nigger on the turnip, the cockchaffer grub among the grasses, or the wireworm in the soil.

These are but a few of the herd of destroying insects that rob the agriculturist of his hard-earned grains, and diminish the supply of food that would otherwise gladden the hearts of thousands of our poorer countrymen.

(To be continued.)

Thirsk Natural History Society.—Botanical Exchange Club.—The monthly meeting of the Thirsk Natural History Society was held on the evening of Tuesday, August 11th. Dr. George Lawson, Professor of Chemistry and Natural History at Queen's College, Kingston, Canada West, was elected a corresponding member.

Mr. J. G. Baker communicated a paper, entitled "Notes on the Spring Botany of Wharfedale," in which he mentioned the discovery by himself of *Salix undulata*, in an indigenous condition, by the river side just above Otley. He exhibited specimens of four naturalized grasses, gathered by Mr. D. Carrington near a paper-mill in the neighbourhood of Bury, in Lancashire. These are *Setaria glauca*, *Panicum capillare*, *Digitaria sanguinalis*, and *Eleusine Indica*. The three first-mentioned are natives of southern Europe, the other of Hindostan.

Mr. J. H. Davies exhibited examples of *Orthotrichum fastigiatum* and *O. tenellum* from County Kildare, and of *Tortula papillosa* from hawthorn, between Thirsk and Wordend.

Review.

The Practical Naturalist's Guide; containing Instructions for Collecting, Preparing, and Preserving Specimens in all departments of Zoology, intended for the use of students, amateurs, and travellers. By JAMES BOYD DAVIES, Assistant Conservator of the Natural History Museum, Edinburgh; Fellow of the Royal Physical Society; and Member of the Yorkshire Naturalists' Club. Edinburgh: MACHLACHLAN AND STEWART, 64, South Bridge. London: SIMPKIN, MARSHALL, AND Co. 1858.

This is a small work, of about eighty pages. Its title sufficiently indicates the nature of its contents, but I may add that it is written in an agreeable style, calculated to interest as well as instruct. The instructions appear exceedingly good and full, with the exception of those relating to the preservation of insects, some of which are for the most part out of date, and superseded by modern improvements, and many that might have been given, the writer would appear not to have been aware of.

The Retrospect.

I THINK Mr. O. S. Round, in his paper on the "Gait of Birds," volume viii. page 174, errs in stating that the Heron and Nightjar are the *only* birds possessing the pectinated claw. The Cormorant and Shag both have it, as also the Bitterns, and, I believe, too, the Frigate Bird.—E. K. B.



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R. G. S.—Many thanks for your lines, but they are not suited to our columns. We do not say this because we are insensible to the merits of the poetry, but as a rule we are obliged to decline the poetical productions of our correspondents.

ERRATA IN THE OCTOBER NUMBER.—Pages 231 to 234, No. 11, *C. fuscula* should be *C. furcula*. No. 27, *T. dera*—*T. derasa*. No. 50, *T. janthnai*—*T. janthina*. No. 87, *P. pulchra*—*P. pulchrina*. No. 128, *E. verosata*—*E. venosata*. No. 129, *E. succenturiata*—*E. succenturiata*. No. 139, *E. sonibrinata*—*E. sobrinata*.

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NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

(Continued from page 222.)

CHAPTER VI.



OF a manly and active character, King George the Third was not only fond of military matters, but took likewise a lively interest in the sports of the field, particularly hunting; and the pack of buck-hounds, before mentioned, were therefore kept in superior order. The open nature of the country peculiarly fitted it for such sports, as indeed it is in such regions that the red deer are found in a wild state in Scotland and Ireland. The broken nature of the ground, however, made riding difficult and hazardous, and hence a large number of soldiers, otherwise unemployed, were engaged in intersecting with roads the whole of this sterile region, including the parishes of Sunninghill, East Hampstead, Windlesham, Chobham, and Winkfield. These crossed the country in every direction, forming stars of junction on King's Beech Hill, Bol-ridge and other eminences, the latter having an obelisk on its summit, commemorating the event, with this inscription:—

In bello dormientes,
In pace laborantes;
Otium fugimus.

This memento has long ceased to exist, falling a prey to ruthless hands rather than the ravages of time. These rides were as wide as a turnpike road, perfectly straight, turfed, and accommodated with arches to carry off the water; and one is now known as the Nine Mile Ride, as it runs to that extent. But these works, although forming field roads in some instances, are now scarcely traceable, and will soon become things of the past. The breed of hounds employed were of the heavy and slow kind, in fact large stag-hounds; but this ceased with the death of Earl Cornwallis, about the year 1825-6, when fox-hounds were substituted, which, from the strength of the scent of the stag were enabled to run breast-high, and consequently went at such a pace that it was found necessary to have horses of the fleetest kind, to be able, in sporting phrase, to *live* with them, and the riding has ever since been very severe, and the runs, except in spring, necessarily short. Thus did Bagshot Heath and Sunninghill Waste become alternately—first the scene of the conflict between our wild ancestors and their invaders, a wilderness, a battle-field, a highway, and a hunting-ground.

It may be as well in this place to refer more particularly to the herbage which was and is found on this tract. There are only the three usual

kinds of heath found here, that is the Common Ling, (the *Erica vulgaris* of Linnæus, the *Calluna* of modern botanists,) the Bell-flowered Heath, (*Erica tetralix*,) known as the Purple Heather, and the Maiden Heath. The latter is found almost always where it is marshy, and where sedge and Turfy-hair Grass is found, and is the first to flower in early summer. With this also is found the Cotton Grass, (*Eriophorum*,) which is more properly a rush, and grows in the marshy places; it is unnecessary to say that the cotton is that to which the seed is attached, and when this is shed, a windy day fills the air with these winged *seminæ*. I have heard it said that old wives have manufactured pillows of this substance, but how these experiments answered, I should think very doubtful, although it is certainly a beautiful substance, and much resembles glazed cotton. Simultaneously with the Cotton Grass arise different kinds of the *Orchis* tribe, known popularly as "Cuckoo Spits," merely from the fact that the cuckoo-spit frog-hopper often chooses them as that whereon to deposit his froth. Some of these are spotted lilac, some orange, some light yellow, and others dark purple; the last, however, grow almost exclusively in the moist grass. The commonest are *O. morio*, *O. mascula*, *O. maculata*, *O. pyramidalis*, and *O. latifolia*.

The Brake, Braeken, or Common Fern, (*Pteris aquilina*,) grows very luxuriantly, and I know of no prettier sight than the Purple Heath and Green Fern intermingled beneath a bright sun; but these things soon fade, and it is at all times difficult to get a perfect bloom of the Besom Heath, (*E. tetralix*,) for the colour is so delicate that there are sure to be some brown or faded bells amongst it. I suppose the name "Besom Heath" had some origin, but assuredly the Ling, (*C.* or *E. vulgaris*,) is that commonly used for making brooms. This is quite a business with us, and there is a regular season for Heath-cutting, beginning after the flower is just off, for, of course, all the soft shoots, if cut then, would be so much waste. I have met with varieties in the Besom Heath, but those were only in the colour, the structure being identical, and we all know that white specimens of all are occasionally met with.

Then there is that pretty little plant the Round-leaved Sundew, (*Drosera rotundifolia*,) which is found everywhere just on the margin of moist places. Does the plant subsist upon the little flies which it catches, or is it meant for a trap at all? That the honey-like drops on the hairs do catch small insects every one knows. The Harebell, (*Campanula rotundifolia*,) that delicate flower, is very plentiful upon our banks, and I have sometimes thought that we had two kinds, which, although identical in structure, differ so much in size as to be hardly referable to mere congeniality of soil. The Pasture Scabious, (*Scabiosa succisa*,) is very common, as also the Common Snap-dragon, (*Antirrhinum majus*;) and

upon the rising mounds of turf, sometimes in the very edge of the Heath, the Wild Thyme, (*Thymus serpyllum*;) sheds a sweet perfume upon the evening air.

It would be useless to enumerate all the common flowers of the wild, which, in common with all heathy districts, are found here; however, the true Forget-me-not, (*Myosotis palustris*;) is rare, though growing in plenty within two miles; and we have no Dew-berries, about which such a discussion some years ago was raised, with reference to the mention of it made by Shakespeare in the Midsummer Night's Dream; they were, however, found by one who knew the plant, at Stratford, and I have often gathered them in Essex, with the Dew, or bloom on them. The Ferns I shall give a list of hereafter. We have a great variety of these, more than is usually found in one district. The *Equisetum* also is not uncommon, and grows in great plenty on the slope from a farm called "Bell Vue," towards the east.

There can be no doubt that a light sandy soil, where it is not too poor, is much sooner brought into cultivation, and made to bear decent crops, than strong loam or clay, which receives all for so many years and gives back nothing; but no one can doubt the ultimate advantage of strong land, for when it does return it is a sign that it is to a certain extent made; whereas the sand acts as a filter, and all the rich moisture that is bestowed upon it sinks far below the reach of those vegetables for whose benefit it was put in. It is, therefore, by a happy union of the two that the best effect is produced in a moderate time. Now most of the gardens about us are formed in this manner; and lime is also found to work particularly well, or chalk, upon grass lands. There are many flowers which we grow in the richest luxuriance that make no appearance in clays. Thus Geraniums, particularly the Horse-shoe, (*Pelargonium zonale*;) attain the largest size, and grow, in fact, so much to wood, that it is impossible, without large conservatories to preserve them through the winter, by reason of want of room to accommodate them. The Scarlet, sometimes called the Bath Scarlet, (*P. inquinans*;) which is of a dazzling brilliancy of colour, also grows well. The Rose Geraniums, (*P. graveolens*, *P. capitatum*, and also the *Tricolor*;) thrive perfectly, shewing a great congeniality of soil so far as they are concerned. Of course we have the Herb Robert, (*Geranium Robertianum*;) and the Meadow Crane's-bill, (*G. pratense*;) and it is singular to observe how much resemblance there is between this flower, when its coloured leaves are shed, to the head of a crane or stork.

Fuchsias also are cultivated with great success; and, as we all know, Mr. Standish, whose gardens lie on the verge of the parish, has imported numbers of new species with great success, amongst which the *F. corym-*

biflora and *F. fulgens* are notable examples. Roses we peculiarly plume ourselves upon, and when I first remember our home, the bank surrounding it was covered with Damask Roses, which grew in the common sand, and indeed I believe some yet remain; and the Cabbage and Provence Roses are unrivalled for their luxuriance and fragrance. But I find myself now entered upon a wide sea, and must take breath for another chapter.

(To be continued.)

RAMBLES BY RIVERS.—No. II.

BY SAMUEL HANNAFORD, ESQ.

THE HOPKINS.

"Ignota videre
Flumina gaudebat."—OVID.

WESTWARD ho! Further away from the haunts of men, to where, undisturbed by anything but the songs of our native birds, the busy hum of insects, and the air sweetened by the breath of cattle, and lovely wild plants giving odour as we press them, we may ruralise awhile. We have a friendship for the River which forms the subject of our remarks this month; for years we have wandered, day by day, on its margin, have seen it in all weathers, and in all moods; now gliding along with scarcely a ripple but that caused by the rising of a fish or the plunge of a water-rat; at other times disturbed by winds and floods: which was the grander aspect we could never decide, for each had its peculiar charms to enchant us, and even now looking around our study walls, ornamented with representations of our companions there and then, how much there is to remind us of the happiness our rural walks on its brink afforded us,—red letter days, indeed! but we are getting prosy already.

Near Mount Ararat then does this pretty stream rise, but passing somewhat away from the gold-fields, does not prove of service for washing the precious metal,—on it flows through high banks and low, with here and there a steep rock on one side, and rich arable land on the other, the former densely covered with festoons of the bright pink *Mesembryanthemum*, or "Pigs' Faces," the green *Corræa*, or Fuchsia, the russet-flowered *Pomaderris*, the Betony-leaved Violet, and others which would lengthen our remarks too much to mention. Numerous are the tributaries to the stream in its course. Muston's Creek, the Salt Creek

from Lake Bolac, then Black's River or Emu Creek, and further on Cudgee, or Brucknall's Creek,—these, with fresh-water springs supply the current flow. A little lower down we come to the Hopkins Falls, whose limpid waters sparkle in the sun; and a few miles further, to the Allansford Bridge, past which the stream glides musically along, like the murmur of a pebbly brook in the Old Country, through rich black soil, well stocked with farms, and tenanted by industrious hard-working men. On the margin of another waterfall about a mile onwards, up to which the tide flows from the sea, stand steam saw-mills, and above it Tooram, the station of one of the earliest settlers in the district, thickly surrounded by Eucalypti, Cherry trees, (*Exocarpi*), Box, and Light wood, old and young, such as we may travel a long distance without again seeing.

Nor are these richly-foliaged trees, quiet as they seem to us now, destitute of animal life; come you at nightfall, and watch the merry gambols of the Flying Squirrels and Opossums, leaping from branch to branch; listen to the heavy munching of the Wombat, who is feeding timidly on the grass which surrounds his burrow, into which, if he observes us, he hastens with a celerity which his looks belie; the slothful Koala, or Native Bear, too, comes forth to feast on the young leaves of the Gum-tree, and the long-snouted Bandicoot, (*Perameles nasuta*), climbs about the fallen timber. We have a specimen before us as we write; it measures from the tip of the snout to the end of the tail sixteen inches, the tail itself being two inches and a half. Iris very dark brown, upper parts of the body dark grey, the lower white, the tail slightly hairy, certainly not scaly as some writers state, (at least in the individual before us,) head very long, with slender naked muzzle; fore feet with five toes, the two middle very long, with long claws, the third much shorter, and two clawless rudimentary ones placed some distance behind the others. The hind foot has four toes, the middle one remarkably long, those on each side being only half the length, and the fourth, some way back, also rudimentary. One of the claws on the side toe is bifid. We have taken the young from the pouch about September, at which time also the Flying Squirrel breeds.

The natives, it is said, avow that this singular animal, the Koala, never drinks water; and, as we have elsewhere remarked, we are inclined to believe that not only it, but all the animals of this country, can subsist for a considerable time without; yet in confinement we have frequently seen it thrust its head into a pan of water, probably to supply the moisture which he missed in the dry, long-gathered gum stalks and leaves which formed its food. When these were not fresh, the stems were always devoured first, but when new and moist the leaves were

eaten with infinite relish. There always appears to us somewhat of cruelty in keeping any animal of this kind in confinement, where not only is it deprived of its requisite food, but is unable to follow its natural habits and instincts, and what food it does get, is doled out at prolonged and irregular intervals, by the hand of some child to whom it has been given as a pet. They are remarkably fond of being noticed, and when scratched on the head, utter a low sort of growl, expressive of their gratification.

Singularly lazy is this creature in all its movements, crawling from bough to bough, with its young one grotesquely holding on to its neck, and even when fired at, it scarcely deigns to notice, certainly does not attempt to evade the danger.

Down the River a few hundred yards, and we reach a pretty well-timbered hillock, which is a favourite resort for holiday folk, who pic-nic here on festive days,—we notice shells of the oyster in abundance, which has evidently existed here in former days, but no trace of any beds can be now discovered by the enterprising fishermen who reside here about; and on the stones we get fine specimens of the Acorn Shell, or *Balanus*; and largely too, boughs of the flowering *Pomaderris*. A little picturesque island next meets the eye, endeared to many from its being chosen as a burial-site in early days for their relatives. Further on, we come to Bethungall, where reside more hospitable friends, to whom we never fail to pay our respects in passing, and from this point it is an easy walk to the caves on the coast, only discovered within a very few years,—we shall allude to them in a future paper. Herds of Wallabies frequent this neighbourhood, and even now the Emu is occasionally met with, finding abundance of food in the young shoots of the Brake Fern, (*Pteris esculenta*.) On the high banks here, where flourish some gay flowering plants, the Fish Hawk rears its young, and the native Cat's tracks are conspicuous everywhere. The Cormorant, (*Phalacrocorax leucogaster*), with its olive brown plumage and white breast, mopes on any snag which may rise out of the water, taking flight for a few yards as our boat disturbs him, but anon perching again the moment all is quiet. The pretty Night or Nankeen Heron is abundant, and also the Little Blue Crane, with occasionally the White Egret.

Passing under Mr. Burke's residence, we catch sight of—

“The sea! the sea! the open sea!
The blue, the fresh, the ever free.”

Before we reach it, let us lie quiet awhile: here is the spot for a naturalist to enjoy himself; but be still, and let us light our pipes, for the keen air blows in from the coast. Look out on yonder mud bank,

—what see you there? It is an Ibis, picking its steps carefully, and feeding apparently on the smaller crustacea which fall in its way; and see too those noble Pelicans, with half-crammed pouches.

In this shallow water are myriads of the Long-turreted Cerithium, the Trochus, and others. That bird with the long red bill, with a beautiful silvery plumage, is the Syloehelidon, or Swallow-tailed Tern, whose habits we have alluded to previously in our pages; and that large fellow, the Black Swan, (*Cygnus atratus*,) certainly no "*rara avis*" is he in this country, inhabiting all the western lagoons of Victoria in flocks, varying from two to six, or probably more,—they generally move from one place to another by night, frequently uttering their, to us, discordant notes as they fly. Bishop Stanley, in his "History of British Birds," page 393, remarks, that although this bird cannot dive, it contrives to immerse itself so deep in the water, as to render its body nearly invisible, and thus avoid detection.

On the right is the boat-house of the "Faugh-a-ballagh" Club, with whose members we have spent many a jovial day on this stream; and on the banks almost immediately above it, the cemetery of Warrnambool, which is about a mile inland. Much praise is due to the trustees for the careful manner in which this place is laid out and kept. No ostentation whatever is there, but a quiet rural simplicity pervading everything connected with it,—wild-flowers springing up spontaneously, and decking the graves of those lying there.

Next we come to the fisherman's hut and punt;—let us rest awhile on our oars, and see the result of his haul. Here are Bream, Mullet, Salmon Trout, and a stray Herring, (which fish is generally taken with a fly higher up the stream, in plenty surely to augur well for the success of the recently-established Fishing Company.) We stoop, and find specimens of *Paludina*, or Marsh Shell: and in flower the pretty *Myoporum*. We have a specimen of *Trigla*, or Gurnard, captured here a few years since, which, if not identical with the Flying Gurnard, which, darting from the sea, is able to sustain itself for some time in the air, as in the *Exoceti*, or Flying Fishes, is at any rate nearly allied to it. This pretty fish was about a foot in length, head covered by a bony plate, terminating just before the first dorsal fin, in a spine on each side, teeth much crowded, upper jaw defended on each side by short projecting spines. The eyes are also protected on each side by two sharp spines, arising out of the bony plate before mentioned. The first dorsal is pinkish, about three-quarters of an inch behind the termination of the bony plate, and nine-rayed. Second dorsal immediately behind, silvery, with two pink lines across, extending to within half an inch of the tail, fifteen-rayed. Both these are placed in a furrow, with a row of spines on each side; the pectorals are

divided, the upper being very large, dichotomously-ribbed, of an olive-green with ultramarine spots; three cirrhi-like processes, attached at the base by a membrane form the second pectoral; ventral fins immediately under the pectoral, six-rayed, and pinkish. Anal commences at termination of ventral, and extends to tail. Head and upper parts brown, with occasional dots of black, sides slightly silvered, under parts white, mingled with a reddish tint.

But coming now to the sea, the channel of the river is somewhat narrowed, consequently the stream rushes down with greater rapidity, now forming deep pools which have formed our bathing-places in the morning, and our fishing-ground later in the day, from which as long as crabs were to our hand to serve as bait, we never failed to secure a dish of Bream. The entrance to the river from the sea is barred by a reef; but it is about this locality that we can collect such magnificent *Algæ*, driven in here by the high waves. Let us see now; here is a mass which we pull in on our oar's blade, and we find *Areschougia conferta*, *Acrotylus Australis*, *Appohmia latevirens*, and *Ballia Brunonia*; and in a heap thrown up on the beach we discover no less than six different species of *Caulerpa*, namely:—*geminata*, *filifolia*, *sedioides*, *hypnoides*, *scalpelliformis*, and *obscura*; *Codium tomentosum*, frequent *Callophyllis*, *Bryopsis*, *Curdiaea*, and *Conferva*. A little rock at the mouth of the river, on which grows the elegant Box-leaved *Alyxia*, reminds us much of one of Bewick's tail-pieces—a rugged piece jutting up, with the waves dashing against and over it, and a Cormorant resting on its summit. We once nearly lost our life whilst algologising on the beach near this place; the wind had been blowing a perfect hurricane for many days, causing such a commotion along the coast, as those only who reside westward can understand,—a lull came, and we ventured forth, tightly buttoned up, staff in hand, to make fresh discoveries amidst the dense masses of sea-weed cast on the shore. We noticed at a few paces distance a lovely *Callithamion* left dry by the retreating waves, and rushed forward to secure it ere their return. We succeeded. Another met our eye, and whilst stooping to grasp it, we were thrown down by a crested wave, covered from head to foot with sand, and had we not saved ourselves by thrusting a long stick we had into the ground, we should hardly have been here to-day to speak of the beauties of the Hopkins.

Before closing this paper, we must turn to a very pleasing article by Mackie, on "Sea-weeds as Objects of Design," which lately appeared in the "Art Journal:"—"Bright are the flowers of the earth, the first and choicest ornaments; pure, simple, and holy, their charms can ne'er decay, though familiarity and inconsistency may vulgarise, and innumerable misappropriations make us sometimes wish for the contrast that other less

showy objects would afford. While the fields are radiant with their beauty, and the gentle zephyrs fragrant with their scented odours, the great tide ebbs and flows over the flowerless plants of the sea. Around the huge rocks the perennial fringes of the olive fœe undulate in graceful folds among the swelling waves. I do claim for the neglected vegetation of the sea-side, an elegance of form and structure, a suggestiveness of mathematical designs, a poetry of association and typical expression, a simplicity and modest gracefulness, which will entitle them to the best efforts of the designer."

Then designers, conchologists, algologists, or pure lovers of nature, whoever and whatever ye are, go to the banks of the Hopkins.

Geelong, Victoria.

Eutomology.

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. R. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 230.)

67. *T. janthina*.—Common, by beating.

68. *T. fimbria*.—Not rare. Several times bred.

N.B.—*T. fimbria* has been bred by Mr. Baker, of Battisford, but I never met with the insect. (B.)

I took this larva in plenty a few years since in Hampshire, during the month of May, by searching among the underwood with a lantern as soon as it got dark. It fed indiscriminately upon all the underwood, but I never found a single larva on a low-growing plant. I never met with it in Suffolk, either in the larva or imago. (C.)

69. *T. interjecta*.—Common, by beating. This species and *Janthina* seem very fond of resting by day among *Clematis*.

70. *T. orbona*.—Plentiful at sugar, and frequently bred.

71. *T. pronuba*.—In immense profusion at sugar. They are truly gluttonous in their habits—perhaps it would be more correct to say *intemperate*—drinking until they are literally swollen. On opening the abdomen it will be found filled with their "favourite vanity."

72. *Noctua glareosa*.—Was taken near Stowmarket by Mr. Arthur Simpson, but rarely. (B.)

73. *N. augur*.—Very common at sugar and light; a perfect nuisance indeed.

N.B.—This insect has of late years entirely disappeared from my hunting-grounds at Stowmarket. (B.)

74. *N. plecta*.—Abundant at sugar, and on nettles. The pupa also found in profusion at roots of various trees.

N.B.—Like *A. putris*, found in the pupa state in profusion at the roots of trees, but never feeding upon them. It is exclusively a *low* feeder. Mr. Stainton gives April as the month for finding this larva, but is in error. It is full-fed in August and September, and is polyphagous upon low-growing plants. (C.)

75. *N. C-nigrum*.—Common at sugar, and on nettles. Double-brooded, I think, as I have taken it at the beginning of July, and again in September.

N.B.—Like my friend Mr. Greene, I have taken this insect in July, and again in September and October, and have no doubt it is double-brooded. (C.)

76. *N. triangulum*.—Common at sugar.

N.B.—The larva of this insect was most abundant in Hants., feeding in May by night upon bramble and various underwood. (C.)

77. *N. rhomboidea*.—Once at sugar.

78. *N. brunnea*.—Rare, at light, and bred.

N.B.—I also took this larva in profusion in May, by lantern-light, upon various underwood. In Bucks. it is a perfect pest at sugar, coming in swarms in July. (C.)

79. *N. festiva*.—In great profusion and variety at sugar, light, and on nettles. Also frequently bred.

N.B.—Abundant in the larva state in May upon underwood, principally bramble and honeysuckle. (C.)

80. *N. bella*.—Very common at light.

N.B.—This insect must be double-brooded. I have beaten it in June, and again in August and September. (C.)

81. *N. umbrosa*.—Common at light.

82. *N. baja*.—Not uncommon. Occasionally at light and sugar, but more frequently by breeding: the larva feeds on primrose, etc.

N.B.—The larva, which closely resembles that of *N. festiva*, was common in Hants., upon underwood at night, towards the end of May and beginning of June. (C.)

83. *N. xanthographa*.—In aggravating profusion. The pupa may be sometimes found at roots of trees, and, when bred, it is often a pretty insect.

N.B.—The larva of this insect is of a dirty whitey-brown colour, with two rows of black dorsal spots. It hibernates and feeds up in the early spring. It will feed on chickweed and many other low-growing plants. It is full-fed about April; it then spins a cocoon just under the surface of the earth, but does not assume the pupa state till the end of June or July. It closely resembles those of the *Leucaniæ*. (C.)

84. *T. piniperda*.—I met with only one imago of this species. I, however, beat the truly beautiful larva not unfrequently from fir-trees in the woods about Kesgrave. It is terribly exposed to the attacks of ichneumons. Feeling tolerably certain of finding the pupa I neglected the larva, and was

properly punished for my indolence, for, though I searched carefully day after day, I did not find one. I cannot account for this.

N.B.—Like my friend Mr. Greene, I have never been able to find the pupa of this insect, though I have searched for it in localities where I knew the larva was by no means uncommon. The pretty larva is so horribly persecuted by ichneumons that I am induced to think that not one in twenty ever turns to a pupa at all. I have taken the moth at willow-blossoms in April. (C.)

85. *T. Gothica*.—Common of course. The food for the larva, given in the "Manual," is "broom, clover, lilac, etc." It may very possibly feed on all these, being apparently polyphagous, but they are certainly not the proper plants to search. It is unquestionably a tree-feeder, preferring the oak.

N.B.—That the larva of this insect ever feeds on broom or clover, as stated in the "Manual," unless compelled, I do not believe. It invariably feeds upon trees or tall shrubs; upon these it is polyphagous. I have frequently found a weak miserable ichneumonid larva on the ground, or upon some low-growing plant, but its being there was no choice of its own. It had fallen from some adjacent tree, and was too weak to crawl up again: I never saw a healthy larva in such a situation. (C.)

86. *T. rubricosa*.—Taken at willow-blossoms near Stowmarket, but rare. (C.)

87. *T. instabilis*.—Common.

88. *T. populeti*.—One solitary specimen at sugar.

N.B.—The larva of this insect is said in the "Manual" to be unknown, but is described by Mr. Doubleday in the "Zoologist," page 5436, who both bred it from the egg, and took it on aspen. It also feeds upon the black Italian poplar, under which tree I have dug up the pupa at Stowmarket. I found the larva this year, 1858, June 1st., upon the same tree, when searching for the larva of *T. subtusa*. When young it closely resembles this last-mentioned larva, and spins itself up in the same way between two leaves, or by uniting the edges of one. When full-fed its semi-transparent appearance reminded me strongly of the larva of *C. or*, but its blackish head was a distinct character. It is, however, extremely unlike the larva of the other *Teniocampæ*. The pupa is very similar to that of *T. gothica*. (C.)

89. *T. stabilis*.—Very common.

90. *T. munda*.—Two at sugar.

(To be continued.)

A LIST OF THE INSECTS OBSERVED IN THE SOUTHERN PART OF THE COUNTY OF SUSSEX.

BY W. C. UNWIN, LEWES.

(Continued from page 210.)

No. VI.—INCLUDING PROSOPIS, SPHECODES, AND HALICTUS.

PROSOPIS.

Prosopis communis.—Taken near Rottingdean in June, but sparingly.

P. dilatata.—I had the good fortune to capture this species on the 14th. of June, of the present year, 1858: it appears to be both very local and rare. Mr. Smith tells us that not more than half-a-dozen specimens have come under his notice altogether, and those principally from Arundel, in Sussex. Mine were taken near Brighton.

P. signata.—Not by any means uncommon in this neighbourhood in June; both male and female have been captured. They were both seen in some plenty in 1857, near Lewes.

SUB-FAMILY II.—ACUTILINGUES.—WESTWOOD.

SPHECODES.—LATREILLE.

Sphecodes gibbus.—Of very frequent occurrence near Brighton and at Eastbourne, but I have not observed it in the vicinity of Lewes. It appears in May.

S. rufescens.—Very common; several colonies in this neighbourhood are annually observed. Appears in May.

S. ephippia.—Equally common with the last, and commonly inhabits the same bank. The beginning of May.

HALICTUS.

Halictus rubicundus.—The most common species of the genus, and appears to be generally distributed. It appears throughout April, May, and June; and I would here remark that the females of this genus invariably appear in the spring, whereas the males are not to be found until the autumn. For more detailed remarks on their economy, see Mr. Smith's interesting account in his "Monograph," page 21.

H. xanthopus.—Common in this locality and near Brighton in April and May. It is apparently a southern species, and local. It is a very beautiful species.

H. leucozonius.—Of frequent occurrence in August on *Hypochaeris radicata* and the Ragwort, (*Senecio Jacobæa*.) I have never met with a colony.

H. quadrinotatus.—This is a rare species in this district. It has been captured both near Glynde and Lewes.

H. cylindricus.—Most abundant, but very variable in point of size. It has a very strong aromatic scent, very similar to musk. The females appear early in April, and the males in August, on thistle-heads; both black and red varieties are equally common. Its colonies are of frequent occurrence.

H. albipes.—Not uncommon. The females, in common with many of this tribe, are especially partial to the flowers of the Dandelion, (*Taraxacum officinale*.) in spring; the males are difficult to discriminate from those of *Cylindricus* to the unpractised eye.

H. lugubris.—It appears to be locally distributed. It is not of uncommon occurrence near Brighton, Lewes, etc., in spring and autumn.

H. flavipes.—Common near Offham and elsewhere. This species also frequents the Dandelion in early spring and the Ragwort in the autumn. Both *Hymenoptera* and *Diptera* are most attracted by yellow flowers, and especially those of the *Compositæ*. It is a very interesting sight on a glowing August

day to see the *Halicti* and several of the *Diptera* clustered on the heads of the Ragwort, revelling in its golden blossoms.

H. smeathmanellus.—Not uncommon, although it is somewhat local even in this district. It has been taken near Brighton, Hove, etc. The females only have been observed.

H. æratus.—Common; appearing in May and June. We have several colonies in the immediate neighbourhood.

H. morio.—Very abundant, and found everywhere. We have a mixed colony near Kingston, composed of this species, *H. rubicundus*, and *Sphcodes rufescens*. The males are frequently observed late in the autumn. I have observed it enter the wall of my garden frequently.

H. leucopus.—Rare. Found near Lewes and Hove, but sparingly.

H. fulvicornis.—The male only of this species has yet been observed, not unfrequently in the autumn upon the flowers of the Ragwort, (*Senecio Jacobæa*.)

H. longulus.—Very local; specimens have been captured near Hove, by the coast, in July. Its colonies were very numerous in 1856, along the coast, extending for nearly two miles, between Southsea Common and Cumberland Fort, near Portsmouth.

H. minutus.—Not uncommon, and pretty generally distributed. I have taken it near Lewes, Seaford, Eastbourne, and Brighton, in May and June.

H. nitidiusculus.—Common in this locality generally in May and June, frequenting the flowers of the *Ranunculi*.

H. minutissimus.—The smallest of the species, and readily distinguished from its allies: it may be termed tolerably common. It associates with *H. rubicundis*, *æratus*, and *Sphcodes ephippia*, being frequently found mixed with them in the same colony.

(To be continued.)

EXTRACTS FROM

SMITH'S CATALOGUE OF BRITISH HYMENOPTERA.

GENUS SPHECODES.

THE bees which are included in this genus have hitherto been regarded as parasites on those comprised in the genus *Halictus*, and indeed many circumstances tend to support such a supposition; they are usually found burrowing not only in similar situations, but forming mixed colonies; the females of both genera appear some time before the males, and in fact their economy is alike. St. Fargeau places them amongst his division of parasites, immediately following his exotic genus *Rathymus*, with which they have not the slightest affinity; their only resemblance being in the distribution of the colours, black and red. The result of my observations leads to the conclusion that no species of the *Andrenidæ* is parasitic. The only apparent support of the theory of their parasitism, is the absence of the usual polleniferous organs; such however is also the case in *Prosopis*, *Ceratina*, etc. In the year 1849 I discovered a

mixed colony of the *Halictus abdominalis*, *Andrena nigro-enea*, *Halictus morio*, *Sphecodes subquadratus*, and *S. Geoffroyellus*; this being at a short distance from my house, I had an opportunity of frequently observing their economy; my visits to the colony were frequent, and I made close observations of the proceedings of the bees; yet, notwithstanding, I could not in a single instance detect the *Sphecodes* entering the burrows of *Halictus*; those into which the former bee entered were of a smaller diameter than those of *Halictus*, in fact intermediate in size between the burrows of *H. abdominalis* and *H. morio*—too small to have admitted the female of *abdominalis*. These proceedings were observed on several occasions; no males of any of the bees were to be seen at this time, those of *Andrena* having disappeared some time, and those of the *Halicti* not being developed. On visiting the colony one cloudy morning, I was much delighted to observe the head of one of the species of bees at the mouth of most of the burrows—the female *Halicti* at their own burrows, and *Sphecodes* also at *their own*. The result of my observations of this colony led me to believe, still more firmly, that *Sphecodes* is not a parasite. Since the time when the above observations were made, I have on several occasions detected *Sphecodes* busily engaged in forming her burrow, a fact which I consider conclusive of the correctness of the opinions above stated.

GENUS HALICTUS.

THE economy of this genus of *Andrenidæ* does not appear to have been ascertained previous to my own observations being published in the year 1850: it is so remarkably different to that of all other solitary bees, except of those belonging to the genus *Sphecodes*, that I am surprised it had escaped the researches of my predecessors, who, like myself, “have loved to hear the wild bee’s hum.” It will be observed that the females of *Halictus* and *Sphecodes* make their appearance in June, and are to be found from that time until late in the autumn; but no males of these genera will be observed until long after the appearance of the females; my observations on a colony of *H. morio* will serve as the history of the whole genus, making allowance for the different periods of their appearance. “Early in April the females appeared, and continued in numbers up to the end of June; not a single male was to be found at any time. During the month of July scarcely an individual could be found, a solitary female might now and then be seen, but the spring bees had almost disappeared. About the middle of August the males began to come forth, and by the end of the month abounded; the females succeeded the males in their appearance about ten or twelve days. These industrious creatures immediately began the tasks assigned to them, burrowing and forming their nests; one of their little tunnels had usually others running into it, so that a single common entrance served as a passage to several cells, in each of which a little ball of pollen was formed, and a single egg deposited thereon. The larvæ were usually ten or twelve days consuming it, by which time they were fully fed; in this state they laid until they changed to the pupæ state, when they very shortly became matured.” I have reared individuals of *H. rubicundus* from the egg to the perfect insect; on the 15th. of July I procured cells containing the pollen balls with an egg on each; in twelve days the larvæ were full-fed; the

change to the pupa state took place about the 25th. of August, and during the first week of September the perfect state was acquired. The history of *Halictus*, therefore, is as follows:—The males and females appear in the autumn; the latter being impregnated pass the winter in the perfect state, appearing during the following season to perform their economy, as detailed above in the case of *H. morio*. This is the result of my present observations, and I believe it to be the true history of *Halictus* as well as of *Sphecodes*. Humble Bees and Wasps pass the winter months in a torpid state, having been impregnated during the previous autumn, but amongst solitary bees I know no other genera besides *Halictus* and *Sphecodes* which resemble them in this respect.

Suffolk Lepidoptera.—I have only just seen the "List of Lepidoptera," by Messrs. Greene, Crewe, and Bree, in "The Naturalist" from November last to the present time. As I at one time collected in that county, they may, perhaps, be glad to hear what rare insects I met with in that part of Suffolk in which I resided. In 1851 I took seven or eight specimens of both species of *Colias*; they were taken in the parishes of Shelley and Stoke-by-Nayland, and their vicinity. I have not, since that year, seen a single specimen of either. In the same and preceding year I took three or four specimens of *Sinapis* in Raydon Wood, where, I have been told, the late Mr. John Hoy once took the larvæ abundantly. I once saw *Sibilla* in a wood near Stoke-by-Nayland. *Iris* is tolerably abundant in Raydon Wood; I once got eight larvæ in one day there. I was told Mr. Hoy once obtained thirteen after a very hard day's work. *Cardui* was so abundant in 1851 that I took a gross, and could have taken ten times as many. What is very remarkable as to these insects is the fact, that in the spring of that year, a good many apparently hybernated specimens appeared, (much faded.) Now as I had carefully collected in the locality for the two preceding years, and never saw a specimen, it is difficult to understand where the hybernated ones came from. *Paphia* is very common, but I never saw *Adippe* in any of our Suffolk woods. *Lathonia*, according to Miss Jermyn, has been taken at Stoke-by-Nayland,—where, too, I know *Antiopa* occurred a few years ago,—but I had several unsuccessful trips to the place she indicated as the precise spot. Mr. Stainton also speaks of *Lathonia* having occurred at Lavenham, which is in Suffolk. I do not believe *Athalia* is taken in Suffolk; it is abundant, however, in a wood within two miles of Suffolk, namely, at Langham Leap, where I have taken it, as well as *Adippe*, in profusion. *Lucina* is by no means rare at Raydon; I got a very fine series of it there in 1850. I have only once met with *Betula*, and that not at Raydon, where it is said to be found, but on a hedge at Langham, a mile at least from any wood; it was a female much wasted. I have taken all the Hairstreaks indeed, except *Pruni*. I have never seen *Argiolus*, but *Corydon* I have taken in boundless profusion just on the borders of Cambridgeshire, but in Suffolk. *Agestis* is certainly not an uncommon insect in the neighbourhood of Stoke-by-Nayland. *Alveolus* and *Tages* are common enough at Raydon, but I

agree with Mr. Bree in believing *Galathea* not to be a Suffolk insect; it is however abundant in a wood on the Essex side of the River Stour, which divides the counties. I bred two or three specimens of *Bembeciformis*, and I one day took three specimens of *Bombyliiformis* in Raydon Wood. *Batis* and *Derasa* are not uncommon in a wood called Snake Wood, at Stoke. I have never seen *E. versicolor* at Raydon, but I think it must be there.—R. B. P., Grays Inn, London.

[The above communication, for which we are obliged, is authenticated by the writer's name.—Ed.]

Double-broodedness of the Notodontæ.—In "The Naturalist" for April, 1858, No. 86, page 82, I remarked that it was my firm opinion that *P. palpina* was double-brooded, and gave my reasons for saying so. I am now happy to state that my friend Mr. Gascoyne, of Newark, who has with the most untiring perseverance set himself to work to prove the double-broodedness of some of the *Notodontæ* by incontrovertible facts, has been rewarded with the most signal success, and amongst others has proved upon evidence which nothing can gainsay, that *P. palpina* is double-brooded. He has given the result of his experiments in the "Zoologist" for September, page 6248. As many of the readers of "The Naturalist" do not see the "Zoologist," and as I believe I was the first person who started the double-brooded discussion, I may perhaps be excused if I give a short summary of Mr. Gascoyne's remarks. In the autumn of 1857 he had a number of pupæ of *P. palpina*. The moths began to appear May 28th., 1858, and in the course of a week every single pupa had produced a moth. From these insects he obtained two sets of fertile eggs. The first batch was laid May 30th. and 31st.; hatched June 8th. and 9th.; larvæ full-fed and buried June 27th. to July 4th.; all the moths emerged July 27th. to August 5th. The second batch was laid June 6th. and 7th.; hatched June 14th. and 15th.; larvæ buried July 10th. to 17th.; moths emerged August 5th. to 12th. Part of the first brood were kept entirely out of doors. Accident killed all but three; these were full-fed at the same time as those kept in confinement, and two moths appeared August 5th. The other larvæ of both sets, though kept in confinement, were fed upon growing plants. It is clear, therefore, that *P. palpina* is double-brooded both out of doors and in, that is, in its natural state, and that keeping the larvæ in confinement makes no difference at all. I now go on to *N. dictæa*, still quoting Mr. Gascoyne. From his autumnal pupæ of 1857 the moths began to emerge June 1st., 1858; eggs were laid June 3rd. and 4th.; hatched June 12th.; larvæ buried July 13th. to 19th.; moths emerged August 12th. to 17th. These larvæ were also fed upon growing plants. Lastly I come to *N. ziczac*. On July 17th., 1858, Mr. Gascoyne took twenty-two full-fed larvæ of this insect. Two died, the rest buried directly. The pupæ were kept almost all the time out of doors, and every one produced a moth from August 12th. to 15th. Now of course all these larvæ must have been hatched from eggs laid in May or June, and the moth which laid them was the parent of those which emerged in August. Now Mr. Edwin Shepherd, one of the strongest opponents of the double-brooded theory, said if we could prove this the chain of evidence would

be complete. My friend Mr. Greene, in replying to my remarks, ("Naturalist," No. 87, page 111,) objects that there is no recorded instance of the pupæ of *Notodonta* dug up even so early as the beginning of August, producing moths the same year, but here is the instance, for it is clear, beyond the shadow of a doubt, that if Mr. G. had not taken these larvæ of *N. ziczac*, they would have gone down, and might have been dug up, and if they had would have produced moths the same year. I may add that in the case of both *P. palpina* and *N. dictæa*, the moths which came out in August paired, laid eggs, and the larvæ were reared. In conclusion, I cannot refrain from expressing my feelings of pleasure and satisfaction that all those assertions which I made when the double-brooded question was first agitated in the pages of the "Zoologist," have been so fully confirmed and established upon such incontrovertible evidence and infrangible proof. I cannot let the present opportunity go by without thanking Mr. Gascoyne most cordially for the indefatigable energy and perseverance with which he has pursued his experiments, and congratulate him most sincerely upon his signal success.—H. HARPUR CREWE, Stowmarket, October 2nd., 1858.

Killing Insects.—I cannot at all agree with Mr. Morris in his recommendation of Chloroform as the best and speediest mode of killing Lepidoptera, and unless "Willie" wishes to bring his insects to grief, I should strongly advise him not to use it. I have tried it over and over again, and have invariably found it turn the insects so rigid and stiff that it is impossible to set them out properly, to say nothing of their coming to life again in nine cases out of ten: I have now collected insects for some years, and have practised death in all manner of ways, and have no hesitation whatever in giving it as my own firm opinion that the strongest liquid ammonia is by far the best I know. Have a close-fitting tin-box made with a false perforated zinc bottom and a lid at each end. Dip a small piece of sponge about the size of a nutmeg into the ammonia, and put it into the false bottom end. Into the other end put your moth or butterfly; leave it there half-an-hour before you set it or it will very likely revive. If you have not a killing-box, a common jam-pot covered over with a square of glass, will do just as well, and perhaps better. You must not kill your insect if bred till it has been out of the pupa an hour or two, as the wings are limp, and the ammonia will spoil them, and what is more, the insect is apt to eject a quantity of pink fluid, into which it will flap in its death-throes, and ruin itself. There are a few insects which must not be killed with ammonia, as it takes away or deadens the colours; they are, however, so few, that they are soon known, and do not at all invalidate the efficacy of the receipt. I mention all those that I know:—*A. galatea*, *C. elpenor*, *C. porcellus*, *X. croceago*, *G. papilionaria*, *P. cytisaria*, *N. viridata*, *T. vernaria* and *lactearia*, *P. bajularia*, *H. thymiaria*, *E. tiliaria* and *fuscantaria*, *L. miaria*, *E. coronata*, *H. quercana*, *prasiana*, and *clorana*, *T. viridana*, and *L. literana*. I should also never think of killing *P. statice* and *globularia*, *D. orion*, *A. aprilina*, *B. glandifera*, or *M. margaritaria* with ammonia, as it almost always injures green. These insects I stupify with chloroform, (only putting them into the fumes for a

minute,) and then pierce them under the thorax with a steel pen dipped in a strong solution of oxalic acid. The ammonia must be kept in a *tightly-stoppered bottle*, as in hot weather it is very restless, and does its best to drive the stopper out. When travelling tie a piece of wash-leather over the stopper, unless you wish your clothes to be saturated. Ammonia is very useful in [removing mildew,—soak a camel's-hair brush in it, and gently brush the mildewed insect. Oxalic acid is a deadly poison, and ammonia is not [very] agreeable to smell, so it is just as well to label both bottles "Poison."—H. HARPUR CREWE, Stowmarket, September 26th., 1858.

Notodonta dictæoides.—I wish to warn my brother entomologists that this insect will not bear relaxing. The other day I put a very fine-bred, but rather ill-set specimen into the relaxing pot, and left it, as I usually do the larger moths, for twenty-four hours. To my horror and disgust, upon taking it out, I found it completely ruined. All the beautiful clear white was turned dirty brown, and the purple gloss utterly gone. The relaxing apparatus was a jam-pot half full of wet sand, and cork on the top.—Idem.

Catocalia nupta.—I was not aware till this year that this insect ever flew in the day-time, but during the last month I have seen no less than four specimens disporting themselves at mid-day with apparently quite as much enjoyment as *V. atalanta* or *Io*.—Idem.

A. atropos and *S. ligustri*.—During the months of August and September four or five larvæ of *S. ligustri* and an equal number of *A. atropos* were found in the Rectory-grounds at Breadsall, near Derby. Neither insect has been seen in the parish before, and I can testify that it has been pretty diligently worked. I once had an old specimen of *S. ligustri*, which was said to have been taken in the outskirts of Derby, but I never myself, till now, saw or heard of the insect being taken in the county. *A. atropos* is also extremely rare.—Idem.

A. atropos.—A larva brought me full-fed July 15th. produced the perfect insect, a splendid male, September 22nd. I did not attempt to force the pupa, but left it entirely to itself, only occasionally moistening the moss with which it was covered.—Idem.

Are Grasshoppers Carnivorous?—I always understood Grasshoppers to be entirely herbivorous; however on Thursday I captured a fine female specimen of *Gryllus viridissimus*, in a field near Margate, and when I came home, put it into a large glass cage, containing several larvæ of *Pontia brassicæ*. It seized one of them, and immediately devoured him. There were many leaves in the cage, and some grass was afterwards put in, but the Grasshopper seemed to prefer the caterpillars, and eat one or two more of them.—W. F. HUNTER, Ceel Square, Margate, September 4th., 1858.

Colias edusa and *hyale*.—I caught a specimen of *Colias hyale* here August 20th., and saw several others. I caught *C. edusa* as early as the middle of July.—Idem.

Colias edusa.—In a clover-field near this place my friend Mr. Bull took five male specimens of *Colias edusa*, during the last week of August.—ARTHUR L. SIMPSON, Stowmarket, September 13th., 1858.

S. convolvuli.—I beg here to record my second capture of *S. convolvuli*. I took a female before breakfast, resting on a ladder full in the sun, on the 1st. of this month. Through the recommendation of the Rev. H. H. Crewe, I placed it in a hat-box, hoping it would lay its eggs, of which it was very full, without injuring itself; but to my disappointment even on the 8th. no eggs were laid, but the insect was spoiled.—Idem.

Vanessa antiopa.—This rare and beautiful insect has, I have no doubt, occurred this year in rather greater numbers than usual, for the following have come under my notice in this neighbourhood:—One taken by Arthur Gruggen, Esq., at Barnby Moor, near Pocklington. One seen by Miss Cornelia and Miss Rose Morris, near Kilnwick Percy; one seen by them also at Emswell, near Driffeld. One taken in the town of Beverley, at a sugar-cask in a cooper's yard; and one captured at Lockington, near Beverley, and obligingly sent to me alive by some unknown contributor there, who desired me to address her as "An Old Woman, Post-office, Lockington."—F. O. MORRIS, Nunburnholme Rectory, September 17th., 1858.

Acherontia atropos.—The larvæ of this great moth seems to have been unusually plentiful this year. In addition to the one mentioned in a previous number, I have since obtained one from Mrs. Conyers, of Emswell, near Driffeld. I have heard of others in various parts of the county; and Mr. James Coutts writes me word of one found at Govan, Glasgow. It was found naturally on the potatoe, but it may be useful to many who hereafter keep them, as potatoe leaves cannot always be obtained, especially when the plants are diseased late in the year, to know that it fed well on the lettuce. It also feeds on the tea-tree and the jasmine. The one in question seems to have caused great speculation in the worthy city of Glasgow, as I learn from some paragraphs from the "Glasgow Herald," sent me by Mr. James Coutts, of that city. It was exhibited as a wonder, and a charge of two-pence was made for a sight of it! This reminds me of a village I have heard of in Dorsetshire, which, I believe, to this day goes by the name of "Monster" so-and-so, whatever the proper name is, which I forget. It appeared that on some occasion an itinerant fishmonger going that way, dropped by accident a live crab in the road, and no creature of the kind having been seen there before, the first peasant who saw it reported to the village that a monster was to be seen, in which opinion his fellow-townsmen, who thereupon trundled out "en masse" to see it, incontinently joined, and so gained for their local habitation the addition to its name of the "sobriquet" I have spoken of.—F. O. MORRIS.

Acherontia atropos.—Is it an unusual thing to take *Acherontia atropos* in the spring? for I have one that was taken on the 15th. of April last, attracted by the street lamps.—F. R. ELLIOT, Tresilian, Kingsbridge, Devon.

[The spring is, we believe, the natural time for the appearance of *A. atropos* on the wing. Mr. Stainton gives August to October for the imago, and from July to October for the larvæ!—Vide "Manual." If the pupæ are kept in a warm atmosphere the imago will sometimes appear in the autumn, but it is clear this is not normal. The plants upon which the larva feeds, and upon which the eggs are deposited, are annuals, such as the potatoe and other solenaceous plants.—ED.]

Deilephila Galii.—On the 20th. of August I captured a beautiful specimen of this insect hovering over a bed of verbenas, in a garden near the residence of the late Colonel Montagu, who was the first to discover it here. These are, I believe, the only two captures in this neighbourhood.—Idem.

Clouded Yellow.—On the 4th. of June I saw a fine male Clouded Yellow Butterfly. I did not succeed in capturing it, although I knocked it down with my hat; before I could secure it it arose and flew across a river where I could not follow. I see Mr. Wesley, of Winchester, has noted one on the 8th. of June, which is the earliest I have ever known except this one. The Clouded Yellow has been tolerably plentiful here this season.—STEPHEN CLOGG, Looe, September 7th., 1858.

P. arion in duplicate.—I have a few unset specimens of *Polyommatus arion* which I should like to exchange with any entomologist for others.—F. R. ELLIOT, Tresilian, Kingsbridge, Devon.

SYSTEMA NATURÆ.

BY THE REV. F. O. MORRIS.

(Continued from page 241.)

PTEROMYS.

Pteromys petaurista, *Schinz.* *Sciurus petaurista*, *Pall.*
Pteromys nitidus, *Desm. Geoff. Schinz.*
Sciurus petaurista, *Cuv. Fisch.*
Pteromys sagitta, *Geoff. Desm. Schinz.*
Sciurus sagitta, *Linn. Schreb.* *Sciuropteris sagitta*, *Less.*
Pteromys genibarbis, *Horsf. Schinz.*
Pteromys lepidus, *Horsf. Schinz.*
Pteromys elegans, *Mull. Schinz.*
Pteromys aurantiaeus, *Munch. Schinz.*
Pteromys Horsfieldii, *Schinz.*
Pteromys volans, *Schinz.* *P. sibiricus*, *Desm.* *P. russicus*, *Tiedem.* *Sciurus volans*, *Linn. Mull. Pall.* *Sciuropterus sibiricus*, *Desm.*

Pteromys volucella, *Schinz.* *Sciurus volucella*, *Schreb. Pall. Cuv.* *Sciuropterus Americanus*, *Desm.* *S. volucella*, *Less. Fisch. F. Cuv. Geoff.*
Pteromys sabrinus, *Rich. Schinz.* *P. Hudsonius*, *Fisch.* *Sciurus Hudsonius*, *Linn. Gmel.* *S. volans-majus*, *Pall.*
Pteromys alpinus, *Rich. Schinz.*
Pteromys fimbriatus, *Schinz.* *Sciuropterus fimbriatus*, *Gray.*
Pteromys Turnbullii, *Schinz.* *Sciuropterus Turnbullii*, *Gray.*
Pteromys derbianus, *Gray. Schinz.*
Pteromys caniceps, *Schinz.* *Sciuropterus caniceps*, *Pearson. Gray.*
Pteromys Pearsonii, *Schinz.* *Sciuropterus Pearsonii*, *Gray.*

Pteromys nobilis, *Schinz*. *Sciuropterus nobilis*, *Gray*. *Pearson*.

Pteromys oregonensis, *Bachm. Schinz*.

Pteromys squamicaudus, *Schinz*. *Anomalurus Fraseri*, *Water*.

Pteromys Oral, *Tikell. Schinz*.

ARCTOMYS.

Arctomys marmota, *Schinz, etc.* *Mus marmota*, *Linn. Schreb*.

Arctomys Bobac, *Schreb. Desm. Less. F. Cuv. Dict. Lich. Schinz.* *Mus arctomys*, *Pall. Forst. Shaw*.

Arctomys Monax, *Harl. Schreb. Schinz.* *Mus Monax*, *Linn. Schreb. Fisch*.

Arctomys Empetra, *Linn. Gmel. Harl. Schinz.* *A. melanopus*, *Kuhl.* *Mus Empetra*, *Pall. Forst. Shaw.* *Monax gris*, *F. Cuv. Geoff*.

Arctomys pruinosus, *Linn. Gmel. Sabine. Schinz*.

Arctomys brachyurus, *Harl. Schinz.* *Anisonix brachiura*, *Rafin*.

Arctomys caligata, *Eschholz. Schinz*.

Arctomys flaviventer, *Bachm. Schinz*.

Arctomys ludovicianus, *Schinz. A. latrans*, *Harl. Fisch. A. missuriensis*, *Warden*.

Arctomys vigil, *Schinz*.

SPERMOPHILUS.

Spermophilus citillus, *Schinz. S. concolor*, *Temm. S. undulatus*, *Temm*.

Arctomys citillus, *Licht.* *Mus citillus*, *Pall.*

Spermophilus Parryi, *Schinz. Arctomys alpina*, *Parry. Less. Harl. Fisch. Wagl. Schreb. Wagn*.

Spermophilus guttatus, *Temm. Schreb. Cuv. Geoff. Schinz*.

Spermophilus mexicanus, *Schinz. S.*

spilosoma, *Bennet. Citillus Mexicanus*, *Licht*.

Spermophilus macrourus, *Bennet. Schinz*.

Spermophilus Franklini, *Sabine. Isid Geoff. Harl. Rich. Fisch. Desm. Schinz*.

Spermophilus Beecheyi, *Schinz*.

Spermophilus Douglasii, *Schinz*.

Spermophilus Richardsonii, *Schinz. Arctomys Richardsonii*, *Sabine. Isid Geoff. Harl*.

Spermophilus Hoodii, *Schinz. Arctomys tredecimlineatus*, *Harl. Sabine. Sciurus tredecimlineatus*, *Mitchill*.

Spermophilus leptodactylus, *Schinz. Citillus leptodactylus*, *Licht*.

Spermophilus mugosaricus, *Schinz. Citillus mugosaricus*, *Licht*.

Spermophilus guttulatus, *Schinz. Arctomys citillus*, *Schreb. Desm. Mus citillus*, *Pall. Temm*.

Spermophilus fulvus, *Schinz. Arctomys fulvus*, *Licht. Blas. Fisch*.

Spermophilus rufescens, *Evers. Schinz*.

Spermophilus musicus, *Menet. Schinz*.

Spermophilus xanthoprymnus, *Schinz. Citillus xanthoprymnus*, *Bennet*.

Spermophilus Eversmanni, *Brandt. Schinz*.

Spermophilus erythrogenys, *Brandt. Schinz*.

Spermophilus Clarkii, *Schinz. Sciurus Clarkii*, *Hamil. Smith. Bachm. Wagn. Schreb*.

Spermophilus lateralis, *Schinz. Sciurus lateralis*, *Say. Harl. Arctomys lateralis*, *Rich. Schreb*.

Spermophilus grammurus, *Schinz. Sciurus grammurus*, *Say. Bachm*.

Tamias grammurus, *Fisch. Wagn*.

(To be continued.)

Miscellaneous Notices.

Birds in India.—There are a great many British Birds found in Oude in the cold season, particularly * Egyptian Neophron, Peregrine Falcon,

Common Starling, *Hoopoe, *House Sparrow, Common Kestrel, Sparrow-Hawk, Marsh Harrier, Hen Harrier, Redshank, Greenshank, *Common Heron, *White Stork, Ruff, *Quail, Kingfisher, (*A. ispida*,) once, Peewit once seen, Whinchat, Sand Martin, Swallow, Black-tailed Godwit, Common Sandpiper, *Green Sandpiper very common, Black-winged Stilt very common, Wigeon, Shoveler very common, Teal, Pintail, Garganey in March and April, Gadwall very common, Ruddy Shieldrake, Pink-footed Goose, Common Snipe and Jack Snipe, and *Stock Dove.—Extract from a letter to C. R. BREE, Esq., from CAPTAIN IRBY, 90th. Light Infantry.

Those marked (*) are found all the year.

The Bar-tailed Godwit.—On the 7th. of May a very good specimen of the Bar-tailed Godwit was captured on board a fishing-boat in mid-channel between this coast and France. It lived many days and fed freely, but died before I got it. It was in good summer plumage.—STEPHEN CLOGG, Looe, September 7th., 1858.

Little Bittern.—On the 21st. of May, a beautiful specimen of the Little Bittern was shot on Tudallit Farm, about two miles from this place; it was brought to me for preservation, in excellent condition, but unfortunately at that time I had a large abscess on my thumb, which prevented my setting it up. I sent it to Plymouth, to a taxidermist, who, I believe, has preserved it, but it has not yet been returned to me.—Idem.

Dusky Serranus.—A fine specimen of the Dusky Serranus, (*Serranus gigas*, Cuv.,) twenty inches in length and seven in breadth, was purchased on Wednesday last in the Falmouth Fish Market by Dr. Vigurs. It was caught in a ground seine net a short distance from the harbour. This and the one procured some years since by Jonathan Couch, Esq., of Polperro, are the only examples of this very rare fish recorded as British. Description:—Body ovate, thick, solid, compressed, of a dusky greyish colour, and covered with scales and brown patches; head rather short; eyes large, irides yellowish, pupils black; jaws, palatine bones, and vomer furnished with sharp teeth, (elongated teeth among the smaller ones;) lower jaw longest, its under surface covered with small scales; lips large and rather fleshy. Nasal orifices two and large; preoperculum denticulated; operculum with three flattened spines behind; dorsal fin single and long; the eleven anterior rays spinous, the seventeen posterior ones flexible; pectoral sub-ovate, eighteen rays; ventral six rays; anal three spinous and eight flexible rays; caudal sixteen rays; branchiostegous rays seven.—W. P. COCKS, Falmouth, September 20th., 1858.

Proceedings of Societies.

York Entomological Society.—This society, which is now progressing satisfactorily, was founded near the commencement of last year, with a view of effecting an earnest co-operation amongst the entomologists of York and neighbourhood, and to aid in the diffusion of knowledge in connection with their entomological pursuits. The meetings are held the first Monday in each month, at eight o'clock in the evening, and have not failed to prove interesting and instructive.

The October meeting was held on the 4th. of that month, at Mr. Prest's, 7, Castlegate, Mr. Birks in the chair.

Mr. Wade exhibited *P. acis*. Mr. Prest exhibited *C. edusa*, ♀ (variety *C. helice*), *C. hyale*, *T. betulæ*, *P. arion*, a fine specimen of *V. antiopa*, captured on the 7th. of September, near York, and *P. festucae*. Mr. R. Anderson exhibited *S. convolvuli*, *Z. arundinis*, *P. palpina*, *D. orion*, *N. paludicola*, and *H. peltigera*. Mr. Robinson exhibited a most perfect specimen of *V. antiopa*, captured on the 13th. of September, near York, also an interesting variety of *S. tithonus*. Mr. B. J. Moore exhibited *T. cynipeforme*, *N. cucullina*, *O. gonostigma*, *H. Banksiana*, *Z. procellaria*, etc. Mr. Helstrip exhibited *A. atropos* and *A. pictaria*, taken near Dartford Heath. The chairman exhibited a fine series of *C. vetusta*. Mr. Moore showed some very well-executed drawings of the majority of the *Sphinges*. The colours and details he had obtained very minutely of each species, and they were much admired.

About forty species of *Lepidoptera*, amongst which were *L. griseola*, *stramineola*, *muscerda*, *N. despecta*, *cannæ*, etc., the kind gift of Mr. W. Winter, Ranworth, Norwich, were duly distributed among the members, and a vote of thanks passed to the donor, together with a resolution to present that gentleman with a testimonial of esteem. It was also resolved that an offer of Wood's "Index Entomologicus" (by purchase) should be accepted.

RULES OF THE SOCIETY.

I.—That this Society shall be founded with a view of effecting an earnest co-operation amongst the entomologists of York, and to aid in the diffusion of knowledge in connexion with their scientific pursuits.

II.—That the Meetings in connexion with this Society shall be held at Mr. Prest's, 7, Castlegate.

III.—The Annual Meeting shall be held on the first Monday in January, when the following Officers shall be elected, namely,—a President, two Vice-Presidents, a Committee of five, and also a Treasurer and Secretary.

IV.—The Monthly Meetings shall be held on the first Monday in each month, at eight o'clock in the evening, when the Members shall be at liberty to discuss the proceedings of the Society, and to exhibit any specimens which they think will interest the Meeting, or make any remarks which may be of use to the Society.

V.—When necessary, the Committee Meetings shall be held before the Members' Meeting, when the business of the Society can be transacted.

VI.—There shall be a payment of sixpence at the commencement of each

Monthly Meeting; or otherwise an Annual Subscription of five shillings, due on the 1st. of January.

VII.—If a person leaves the Society, but wishes to re-enter within six months after he has ceased to be a Member, he shall be eligible on paying up the arrears to the time of his re-entry.

VIII.—Any person anxious to join this Society, must, at the ensuing Meeting, be proposed, and if such proposition is passed he shall be accepted as a Member, and intimation given him to attend the next Meeting.

IX.—There shall be a library in connexion with the Society; but no Member shall be allowed more than one book at a time, which book he can retain a fortnight; but if kept beyond that period he shall be fined at the rate of threepence for each extra week, unless he renews the book, which he shall be allowed to do, provided it has not been applied for by other Members.

X.—Any book lost or damaged shall be made good by the Member losing or injuring it.

XI.—It shall be optional with the Committee as to whether some books shall circulate.

XII.—The money belonging to the Society shall, after the payment of necessary expenses, be used to provide works for the instruction of the Members; which works shall be added to the library.

ROBERT ANDERSON, Hon. Sec., Coney Street, York, October 7th., 1858.

The Retrospect.

The Gait of Birds.—I am much obliged to E. K. B. for reminding me of my omission in my article on "The Gait of Birds," in not including the Bittern among those which have the middle toe pectinated. I should have said the Heron tribe. That the same formation was found in the Pelican kind I was not aware of.—O. S. ROUND, Richmond Terrace, Westbourne Grove, October, 1858.

The Querist.

In the September number of "The Naturalist" I perceive a correspondent wishes to find the name of a Tern he had recently killed. From his description I make no doubt of its being the *young* of the Arctic Tern, a species far more plentiful on the coast of Devon than the so-called Common Tern. The description of the bird in question agrees with that of the Roseate Tern as regards the colour of the bill and peculiarity of voice especially, and were it not for the shortness of its legs I should judge it to be of that species; but the shortness of the tarsi is a characteristic which distinguishes the Arctic Tern from every other British species, at any age.—JOHN GATCOMBE, Wyndham Place, Plymouth, Sept. 18th., 1858.



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BY C. R. BREE, ESQ.

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the earth is full of Thy riches.—PSALM civ., 24.

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NOTICES TO CORRESPONDENTS.

Communications have been received from MESSRS. H. BUCKLEY;—G. KING;—D. GRAHAM;—REV. R. P. ALINGTON, (two);—W. BARLOW;—C. R. BREE;—W. H. LEATHAM;—J. G. BAKER.

Mr. Guise's paper should have been inserted before. I beg him pardon for the omission, though accidental, and hope that he will shew that he has forgiven me by sending another.—F. O. MORRIS.

Communications, Drawings, Books for Review, and Parcels, to be addressed to the Rev. F. O. MORRIS, Nunburnholme Rectory, Hayton, York.

Advertisements to be forwarded to Messrs. GROOMBRIDGE & SONS, 5, Paternoster Row, London.

ENTOMOLOGY.

Communications have been received from The REV. F. O. MORRIS;—The REV. J. GREENE;—The REV. H. CREWE;—MR. W. C. UNWIN;—MR. E. PARFITT;—CETONIA AURATA, (from whom, if not boxed, chloroformed, pinned, and set, we shall be glad to hear again);—MR. KING;—MR. GIBSON;—R. B. P.

ERRATA IN THE NOVEMBER NUMBER.—Page 255, for *Teniocampee* read *Taniocampa*. Page 262, for *Catocalia* read *Catocala*.

MR. BREE'S address will be until further notice, 130, Princes Street, Edinburgh, where all Entomological Contributions, Books for Review, etc., are to be sent.

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NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

(Continued from page 248.)

CHAPTER VII.



WHEN we speak of the wild *flora* of such a district as this, the list of plants must be necessarily very extensive. Those plants which grow on the road-side are most familiar to us. The Marsh Mallow, (*Malva sylvestris*,) is found on the sides of all the ditches, but never out of the cultivated parts. The Nightshade, (*Solanum nigrum*,) Feverfew, (*Pyrethrum*,) Meadow Sweet, (*Spiræa ulmaria*,) and in fact all the common weeds, which do not require a rich soil, are found. As soon as cultivation asserts its empire field flowers that thrive in a richer soil appear, and here we come to one of those facts of nature, so unfathomable, that it is idle if not impious to speculate, for we know what use authors, such as that of the "Vestiges of Creation" have made of them. In some of the coppices near the church, the Wood Anemone, (*A. nemorosa*,) the Wood Sorrel, (*Oxalis acetosella*,) with Violets and Primroses, are very thickly scattered, and the hedges in the same neighbourhood are filled with Wild Carrot, (*Daucus carota*,) Wood Vetch, (*Vicia sylvatica*,) Wild Parsnip, (*Pastinaca sylvestris*,) and Wild Parsley, (*Caucalis anthriscus*,) Mullein also is found in the grass-lands, (few indeed we can boast out of the village.) There are some portions of the wild where it is grassy, and here I have often found Gentian in a wild state, smaller and lighter-coloured than the garden flower, but undoubtedly identical with it; and rushes of all kinds are of luxuriant growth. As long as we are upon the common, which commences about half a mile west of the church, the violets are the common unscented ones, but in the coppices they are fragrant enough. There are a great many wild flowers, too minute to make any show, but lovely themselves; thus the Pimpernel, (*Anagallis*) and the Speedwell are delicately-coloured plants, but as tender as they are small, and die as soon as handled. Fox-glove, (*Digitalis*,) is very common, and grows to a large size; and the Bind-weeds, white and pink are common, but the Wild Clematis and other hedge plants, we see nothing of, no, not even in the cultivated parts; the moorland air is "ower cauld" for these gentry.

I have before referred to the heath, and shall only observe that the Ling is very various, as to its bloom, in colour and volume, some being quite light and single, whilst other specimens are deep pink and very double. Heath appears to like drought, for it is in hot dry years that it

is most luxuriant. The mosses which grow among the roots of the heath are white, brown, and scarlet-tipped, which last is a pretty plant, and generally grows in small spaces between the heath-tufts on the slope of a hill.

We have a great variety of grasses, but the Shaking Grass is not of the number; that which thrives most, greatly to the farmers loss and annoyance, is the Couch Grass, which when once it gets into the land, is extremely difficult to eradicate, and in fact, only is effectually got rid of by bettering the soil itself, for it requires a sand to run in, being formed of hollow shoots with joints, from each of which it sprouts, and if one be left, this will produce others with incredible celerity.

When we come to the ferns, (filices,) as I have before observed, we have a very numerous list. Of course the Brakes, (*Pteris aquilina*,) is that best known because most plentiful, but then there are other kinds scarcely less so, but which growing in more concealed situations, and of a small size, make less show. Thus the Common Polypody, (*Polypodium vulgare*,) is found on the banks in most of the lanes, and the Hard Fern, (*Blechnum boreale* or *spicant*,) in moist ditches. The *Filix-mas* is also very generally distributed in the cultivated parts, and even appears occasionally in the heathy banks where there is any grass. Near Broomhall, in a lane leading close by the site of the ancient monastery, I have found some delicate specimens of the *Filix-fœmina*; the *Adiantum nigrum* and *A. thelypteris* are occasionally found near Sunninghill Bog, in the banks of cottage gardens. On the verge of the parish eastward, we boast of some beautiful specimens of the Royal Fern, (*Osmunda regalis*;) and a servant in our employ obtained a splendid plant from the immediate neighbourhood of Cheapside, but the spot was kept a secret, and I only suspect whence it came, but as there is no doubt on the point, it is sufficient to establish the fact. Hart's Tongue, (*Scolopendrium*,) I believe we have none of, although I did once find an elegant specimen in a shaft of a cellar; but it is found some eight miles off in plenty. Several of the Beech Ferns grow in the hedges of Sillwood Park, in the centre of the village, and some of them attain a large size. We have not the Wall Rue, I believe it is a native of our soil, but grows in profusion on the east wall of Windsor Castle. Before I knew this plant well, I remember pouncing upon a leaf or two in Dungeon Ghyll, as a prize; but familiarity breeds contempt, and accordingly I now laugh at the value I then set on specimens of which I afterwards got enough and to spare. Club Moss, (*Lycopodium*,) and Horse-tail, (*Equisetum*,) are not uncommon, but these are only found in particular localities, and I never met with Adder's Tongue or Spleen-wort, nearer to us than Marlow Woods. I have always been to a certain degree sceptical as to some plants of this kind which have been made distinct

species, and therefore I shall not set down a list here of all those said to be found in this locality, which still boasts of as many of the tribe, if not more, than any one district in England.

(To be continued.)

THE BRITISH WILD GEESE.

Read before the Natural History Section of the British Association, at Leeds,
September 24th., 1858.

BY ARTHUR STRICKLAND, ESQ.

GEESE are a natural group of birds possessing several strongly-marked characters; they are aquatic birds, but live and feed much upon dry land; they feed in the day-time and rest at night, whereas ducks rest in the day-time and feed at night. They of all birds seem to undergo the least changes of colour in their plumage, the males, females, and young birds in winter and summer being nearly alike, thus differing greatly from the duck tribe. They have a character apparently peculiar to themselves, that of having in many cases the most perfect and delicate colours of their bills and legs when young, and losing that delicacy as they advance in age, thus entirely reversing the usual order. Some of the British Wild Geese, which we have now to consider, are so alike in plumage, that that important character can hardly be taken as an element to assist in discriminating the species, the forms and colour of their bills and legs, and the habits of the birds in a state of nature, being all apparently that we can safely rely upon. Besides this, they are the most difficult of all birds to study, the determined and persevering sportsman only being able to approach them; the naturalist has but few and only casual opportunities of examining them. From these circumstances the authors of works on British Birds seem to have been satisfied to take matters as they found them, giving themselves no trouble to examine carefully the characters of the species they describe, and only giving the accounts of their appearance and disappearance, and habits, as mentioned by others, and collecting the records of their having been met with in various parts of the country. Now Mr. Gould has given us three British Geese—the White-fronted, the Grey-lag, and the Bean Goose, thus including all that are not the two first above-named species, under the mysterious and misused names of *Segetum*, or Bean Goose. I will first make a few remarks on these two.

The *Anas albifrons*, or White-fronted Goose; in this the white band in front, (which is seldom wanting,) the plain flesh-coloured bill, the conspicuous black patches on the breast, and the orange-coloured legs will always mark this bird. It is not, or probably ever was, a regular migratory or

abundant species in this country, but is occasionally found in hard weather singly or in small groups, frequenting river sides or running streams, and I believe is never found in the open country, but it is stated to be found in large migratory flocks on the continent of Europe and America, and is the only British Goose found in the latter country.

The *Anas ferus* or *Anser*, the Grey-lag Goose, never was a migratory species in this country, but permanently resided and bred in the carrs of Yorkshire, and probably the fens of Lincolnshire; but it has long since been banished from these places, yet still breeds sparingly in the western islands of Scotland. These birds are the origin of our Domestic Goose, and I had lately an opportunity of removing all doubts upon that subject by observing three beautiful birds brought from Scotland by a friend of mine, which were taken when he was shooting in that country. They at once assumed all the characters and habits of the domestic bird, and had they not come to an untimely end, would probably soon not have been capable of being distinguished from them; they also exemplified my statement of the perfection of the colours of the bills of young birds. Nothing could exceed the beauty of their pink bills and white nails, so much so as to as well warrant us to consider them a distinct species, under the name of the Pink-billed Goose, as has been done in the case of the Pink-footed Goose, soon to be noticed. With these remarks I dismiss these two species, and proceed to consider what remains of this group, not the Grey-lag or White-fronted Goose.

From time immemorial one of the features of the north and east of England, has been the regular periodical appearance of countless flocks of Wild Geese, which arrive every autumn about the end of harvest, and when the objects of nature received more attention than they do in these days got the name of the Bean Goose, as coming in the time of bean-harvest, and when the bean-stubbles were ready for them, can it be doubted that these large flocks are the produce of one distinct species marked by nature with peculiar characters and habits. *This species is the only one that has any claim to the name of Bean Goose, (or Segetum,) the only migratory species in this country, and the only abundant and common species we have.* Unaccountable as the ease may appear, this bird is not figured or characterized in any work on Natural History I am acquainted with, and is not mentioned in the works of Mr. Yarrell, Mr. Gould, or Mr. Morris, further than ascribing the habits of this bird to one given by these authors under the figures and description of an entirely different species, under the erroneous name of *Segetum*, or Bean Goose. Some years ago Mr. Bartlett, struck by the obvious difference between the Geese he met with in the markets, and the descriptions and drawings given of the Bean Goose, and not being properly acquainted with the real Bean Goose, was

induced to institute a new species, under the name of the Pink-footed Goose, though I was satisfied from the first this was an erroneous view of of the matter, and that this was really a fictitious species, (being the young of the true Bean Goose,) and further observations have entirely confirmed my convictions; still Mr. Bartlett had the merit in some degree of drawing the distinction between the Long and Short-billed Goose, but the real Bean Goose still remained undescribed. This bird, *the true Segetum*, or Bean Goose, is distinguished by its short and strong bill—its depth at the base being nearly two-thirds of its length—and by its migratory habits differing in that respect from all our other Geese, arriving periodically every autumn, spreading during the day-time over the stubbles and clover fields on the wolds and other open districts, rising like clock-work in the evening, and winging their way in long strings to the sand-banks in the Humber and other safe retreats for the night, returning as punctually in the morning to their feeding-grounds. This bird differs from the Pink-footed Goose in being larger, having a stronger bill and lighter plumage; but these differences are the result of age, not of species, and a careful examination of the numerous flocks on the wolds, as well as the individuals killed out of them will confirm this.

The next bird to be considered is the Long-billed Goose, figured and described by Mr. Yarrell, Mr. Gould, and Mr. Morris under the name of *Segetum*, or Bean Goose. This is distinguished by having the bill exactly twice the length of the depth at the base, a proportion quite different from the Short-billed Goose.

Before the beginning of this century, when the carrs of Yorkshire were the resort of countless numbers and numerous species of wildfowl, giving employment to numbers of decoymen, fowlers, and carrmen, I understand it was stated there were two species of Geese frequenting and breeding in the carrs, known by these people by the name of the Grey-lag and the Carr-lag. What the Grey-lag was is well known, as fortunately that bird retains the name originally given to it by the fowlers. What the Carr-lag was it is probably impossible now to demonstrate, but I have every reason to think it was this Long-billed Goose, a bird that resided and bred in the carrs along with the Grey-lag, and like that bird is no longer to be found in these districts, and as far as I know is not now to be found in any part of this country, and is now one of our scarcest British Birds, or almost a lost species. This bird is distinguished from the Short-billed or Bean Goose by its entirely different habits, and, as before stated, by its long bill. It may be thought by some that this difference of length may be the result of age, but this cannot be maintained, as its bill is small and weak, suited to its aquatic habits;—very unlike the short bill of the Bean Goose, suited to its granivorous and herbivorous feeding. It may

be possible the Goose found breeding in the north of Scotland by Mr. Selby may be this species, but the distinction between the Long and Short-billed Goose has been so entirely overlooked that we cannot determine that without further research. I will now give a list of the species.

Anas albifrons, (White-fronted Goose.)—Bill flesh coloured, (Gould, 349.)

Anas ferus, or *Anser*, (Grey-lag Wild Goose.)—Bill pink, nail white, (Gould, 347.)

Anas segetum, (Bean Goose, Short-billed or Migratory Goose.)—Bill short, strong, and deep, the depth at the base being nearly two-thirds of its length; pale red in the middle, black at the extremities, but varies much in the proportions of these colours. Old birds nearly as large and pale-coloured as the Grey-lag Goose.

Pink-footed Goose.—Bill nearly the same proportions and colours as the last, but smaller and weaker; bird less and darker coloured; it is the young of the last, but Mr. Yarrell has given us a drawing of nearly an old bird for this supposed species.

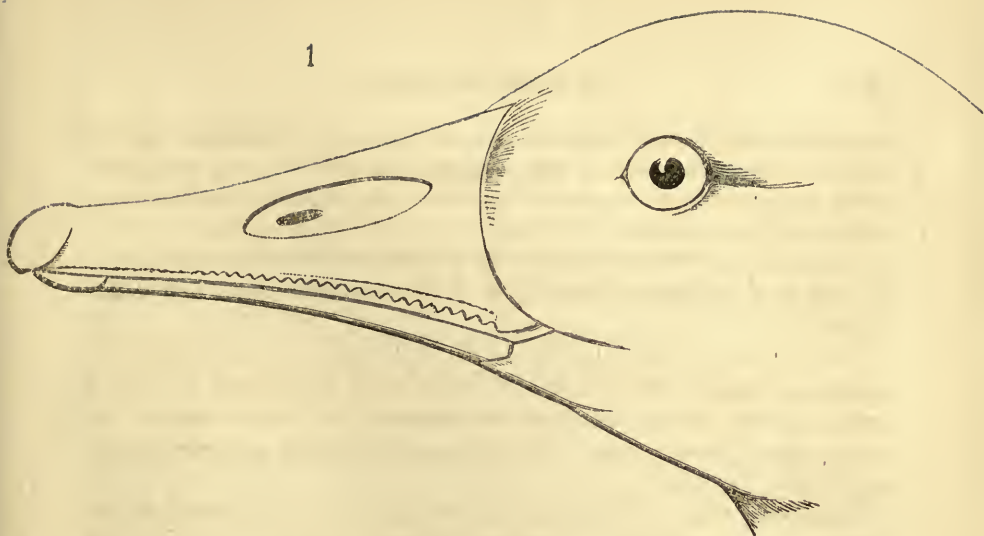
Anas paludosus, (Carr-lag or Long-billed Goose.)—Bill long and weak, being exactly twice the length of its depth at the base. This is the Bean Goose of Mr. Yarrell's and Mr. Gould's drawings, but not of their descriptions. (Gould, plate 348.) The colour of the bill is like that of *Segetum*, and equally various.

Description of the Figures.—No. 1.—*Anas paludosus*.—Size of life; bill strongly toothed, a strong groove running the whole length of the lower mandible; bill two inches and three-quarters long, and one inch and three-eighths deep at the base.

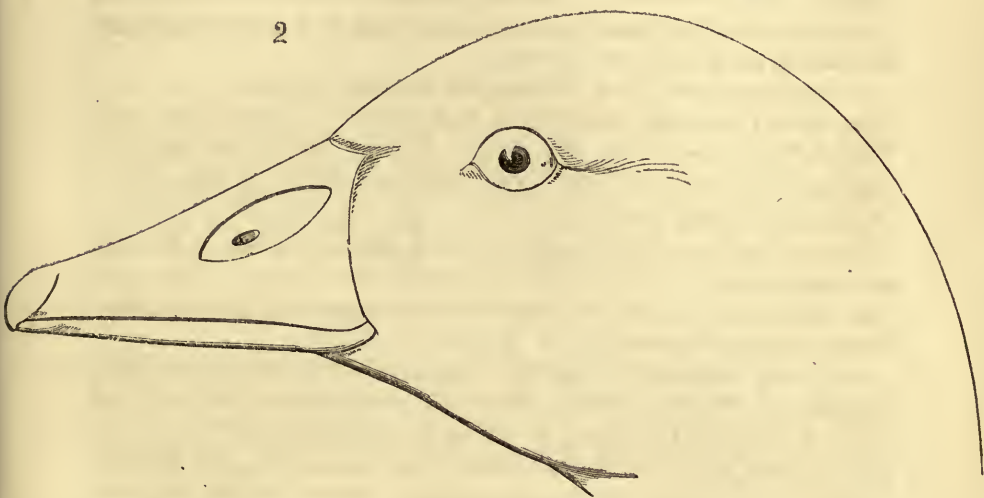
No. 2.—*A. segetum*.—Size of life, from an old bird as large and pale-coloured as a Grey-lag Goose. Bill one inch and seven-eighths long, and one inch and one-eighth deep at the base. In colour like the last, it is a pale red in the middle, and black at the extremities, but they vary greatly in the quantity and form of the black, indeed I have seldom found two alike. The bill of this bird seems more allied to the Bernicles than to the Long-billed Goose, with which it has been so much confounded.

No. 3.—*Pink-footed Goose*.—From a bird received some years ago from Mr. Bartlett; it so entirely resembles the last as not to require description, differing only in being a trifle smaller and weaker, evidently the result of age.

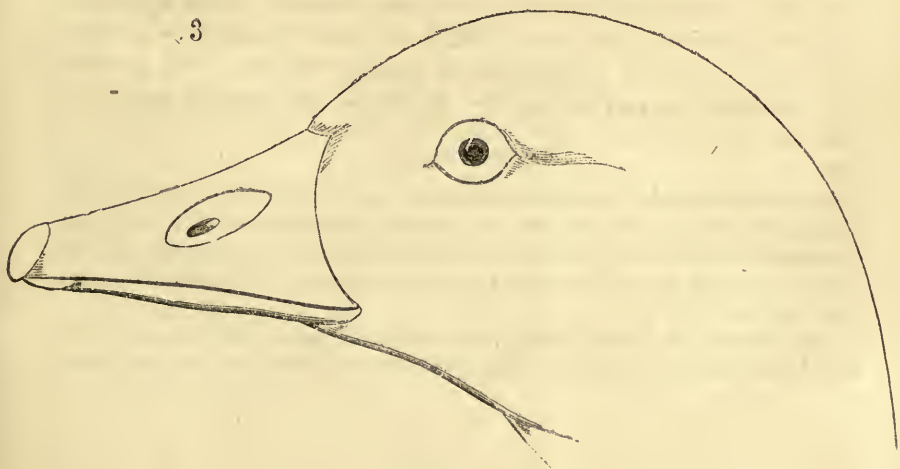
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Entomology.

A LIST OF THE INSECTS OBSERVED
IN THE SOUTHERN PART OF THE COUNTY OF SUSSEX.

BY W. C. UNWIN, LEWES.

(Continued from page 257.)

No. VII.—ANDRENA.

Andrena eximia.—Very rare. I captured one female specimen in April, 1853, near Landport, Lewes, from the blossoms of the blackthorn; and again two more females in April, 1855, from the catkins of the willow, in the same locality.

A. cetti.—Once found near Lewes, in August, 1854; it is said to occur near the coast in the western part of Sussex.

A. cingulata.—Rare. Near Brighton and Portslade, in May.

A. cineraria.—Common, but local in its distribution. Colonies have been observed on the edge of the cliffs, between Brighton and Rottingdean, near Seaford, and also on the coast near Eastbourne. It appears in May. It is a very beautiful species when first disclosed, but soon fades from exposure.

A. thoracica.—This bee appears to usually effect the coast, and has been taken at Newhaven, Seaford, Brighton, and Eastbourne, in May and June, not uncommonly.

A. nitida.—Common on sunny banks in April, frequenting the early spring flowers, particularly the Dandelion, (*Taraxacum officinale*.)

A. albicans.—Abundant. Appears in April and May near Lewes, Fittle, Ringmer, and elsewhere; generally frequenting the flowers of the Red Dead Nettle, (*Lamium purpureum*.) and Ground Ivy, (*Glechoma hederacea*.) The males of all the species make their appearance about ten days or a fortnight before their partners.

(To be continued.)



EXTRACTS FROM
SMITH'S CATALOGUE OF BRITISH HYMENOPTERA.

GENUS ANDRENA.

THE bees included in the genus *Andrena* may be truly said to be the harbingers of spring, for on the first fine days of April males will be found frequenting the catkins and the early flowers of spring; my earliest date of their capture is March 4th., 1849, when I met with *Andrena bicolor* and *Gwynana*, both sexes of each.

This genus is by far the most numerous in species of all the genera of bees found in this country; we have about seventy known species, and when

the northern parts of the country are assiduously searched, no doubt many more will be added. These bees are all burrowers in the ground, some species preferring banks of light earth, others hard-trodden pathways; etc.; their burrows differ in depth, but are seldom less than about six, whilst others excavate to nine or ten inches; at the bottom of each burrow is formed a small oval cell, or chamber, in which the industrious female lays up a small pellet of pollen mixed with honey; these little balls are usually about the size of a garden pea, varying somewhat in size in different species. Sometimes, apparently to economise time, the bee constructs branch tunnels, each having a similar chamber at its extremity; this peculiarity I have observed in *A. rubricata* and *A. fulvescens*; it is also probably not unusual with many other species: when she has completed her task, she closes the mouth of the tunnel.

These bees are subject to the attacks of parasites: the first to be remarked upon are those bees which compose the genus *Nomada*; they are more popularly known as wasp-bees, since they bear a considerable resemblance to some of the small solitary species of that family. These parasites appear to be upon a perfectly friendly footing with the industrious bees, and are permitted, without let or hindrance, to enter their burrows. It has been advanced as a proof of the ingenuity and artifice necessary to be employed in effecting the deposit of their eggs in the working bees' nests, that the parasites should bear a close resemblance to the bees upon which they are parasitic: some instances may undoubtedly be advanced, as *Apathus* and *Bombus*, and also in the different species of *Volucella* which infest the nests of humble bees, but amongst the solitary bees no such resemblance is required to aid in any necessary deception. It may be remarked, that the two cases are not analogous: this is true; and I am not prepared to say that in the case of the *Bombi* and their enemies, it may not be necessary, but as regards solitary bees it certainly is not;—colonies of *Andrenidæ* and their parasites mingle together in perfect harmony, issuing from and entering into the burrows indiscriminately. I have on several occasions watched with much enjoyment a large colony of *Eucera longicornis*, the males occasionally darting forwards with great velocity, then turning sharply round, and as it were swimming in circles close to the ground, then darting off again and again in an unceasing round of sportive enjoyment; their industrious partners, whose whole existence appears to be bound up in one unceasing round of labour, would occasionally return home laden with food for their young progeny. Sometimes it would happen that a *Nomada* had previously entered her nest; when such proved to be the case, she would issue from it, and flying off to a short distance, wait patiently until the parasite came forth, when she would re-enter and deposit her burden. It will be observed, in this instance, that between *Eucera* and *Nomada* no resemblance exists in general appearance, one being several times larger than the other, and covered with pubescence of a sombre colour; whereas the parasite is a gaily-coloured insect, destitute of pubescence, and readily observed from the brightness of its colouring. To some extent I have observed that a constant connexion between certain species exists, and I have never met with some species of these parasites except in connexion with

certain species of *Andrena*; but there are others, as *Nomada ruficornis*, *succincta*, *alternata*, and *Lathburiana*, which infest the nests of several species of *Andrena* indiscriminately; the species are *A. tibialis*, *Trimmerana*, *Afzeliella*, and *fulva*; but the following I have never observed, except connected as follows:—*Nomada lateralis* and *A. longipes*, *N. baccata* and *A. argentata*, *N. borealis* and *A. Clarkella*, *N. Germanica* and *A. fulvescens*, and, lastly, *N. sexfasciata* and *Eucera longicornis*. Much further investigation is still necessary before we can arrive at a knowledge of the real nature of the connexion which exists between the bees and their parasites. It has been supposed that the parasitic larva is hatched sooner than that of the rightful owner of the nest, and that it consequently consumes the food, and leaves the larva of the bee to perish; but to this I do not assent: it appears so contrary to all natural laws, that I cannot think it even probable: nature I have never observed to be thus wasteful of animal life—such a proceeding is unnecessary, and therefore unlikely: where a destruction of animal life is observed, it can usually be traced to some reasonable cause, as the destruction of the larvæ of certain Lepidoptera, being a check upon their superabundance: a parallel to this does not appear to me to exist in the case of the bees: I am more inclined to believe, that when the parasite has deposited her egg upon the store of pollen, the industrious bee at once deserts it, and proceeds to construct a fresh burrow; and that the parasites which may be observed constantly entering different burrows, do so in order that they may find the requisite quantity of food, which will usually be much less than that required for the industrious bee; having found which, they deposit their egg, and the nest is then possibly deserted by its legitimate owner.

The *Andrenidæ* are also subject to the attacks of other enemies, if so they can be called; we have seen that in the first place their food is attacked by *Nomadæ*, we are now to find their larvæ attacked by insects belonging to the Order Coleoptera; these belong to the genus *Stylops*, which several distinguished entomologists of the present day agree in placing amongst the Heteromerous parasitic beetles. These insects were placed in a new order by Mr. Kirby, named *Strepsiptera*, and as such they are still regarded by many entomologists; we have at present only to do with them as enemies to the bees, and briefly to narrate the manner in which the latter are attacked by them. These insects are diminutive in size, the largest known species not exceeding a quarter of an inch in length; we are now speaking of the winged males; the females are apterous grub-like insects, which never leave the bodies of the bees. If the abdomens of a number of *Andrenidæ* be examined, it is most probable that the female of *Stylops* will be found; her presence is known by the protrusion of her head and a portion of the thorax between the abdominal segments on their superior surface, resembling the point of a small bud of a brown colour, or rather a flattened scale. I have several times bred the larvæ of *Stylops* in the following manner:—On finding a bee infested as described, place her in a box five or six inches square, cover it with gauze, and supply the bee with fresh flowers such as the *Andrenidæ* frequent; examine the bee every day, and it is most likely that in eight or ten days she will appear as if her abdomen were covered with

dust; examine it, and in all probability she will be found to be covered with an innumerable quantity of exceedingly minute animals; these are the larvæ of *Stylops*; by the aid of a magnifying-glass they may be seen to issue from the transverse aperture on the thorax: when the bee re-enters the cell, or settles upon flowers, these diminutive creatures will of course occasionally be deposited, and by these means, when other bees visit the flowers, they attach themselves to them and are carried to their nests. Judging from the multitude of larvæ produced by each female *Stylops*, amounting to many hundreds in each case, and the rarity of the perfect insect, the majority must perish, probably in their larval condition. From the fact of seldom more than two *Stylops* being found to infest the same bee, we may suppose that to be the largest number which infests one larva of an *Andrena*; they undergo their changes in the body of the bee, the male on its final transformation becoming an active winged insect, the female remaining a mere apod, attached for life to the bee which nourished it. A most complete and interesting summary of the observations of entomologists on these parasites, will be found in the twentieth volume of the "Transactions of the Linnæan Society," by Mr. George Newport, who has in this paper entered most minutely into the anatomy, functions, and development of these remarkable parasites, being the most interesting and complete essay on the subject yet written.

There are still other parasites to be noticed, which will occasionally be found on the bodies of these bees; the first to be noticed is a small orange-coloured *Pediculus*, which is about one-tenth of an inch in length; this is the larva of *Meloë*; I have several times reared these hexapods from the eggs of that beetle. For the most complete account of their history, reference must be made to the twentieth volume of the "Linnæan Transactions," which contains Mr. George Newport's most interesting memoir on *Meloë cicatricosus*; in this paper it is shown that the larva of the beetle feeds on that of *Anthophora pilipes*; but it remains to be proved, that the larva of an *Andrena* can serve as food for the larva of a *Meloë*; I am inclined to think this can never be the case, and that the fact of our finding them on these bees is a mere indication of the usual habit of the larvæ in attaching themselves to any insect which comes in their way, for we as constantly find them on Diptera and flower-visiting Coleoptera as upon the *Andrenidæ*: it has been shown that a larva of *Anthophora* will nourish that of *Meloë*, but so small a larva as that of *Andrena* can I think scarcely answer that purpose; I have however included them, but merely as supposed parasites on *Andrena*.

We now come to the last supposed parasite on these bees; it is found on their bodies, and exactly resembles in form the last-mentioned, but is of a brown-black colour, and is full twice the size; they attach themselves to the hairy parts of the bees, as the metathorax, and the sides of the thorax beneath the wings. What these pediculi really are, is at present involved in complete obscurity; Mr. Kirby regarded them as insects in their perfect condition, naming them *Pediculus Melittæ*. I have frequently observed these creatures in considerable numbers in the flowers of *Ranunculus acris*, as many as twenty or more in a single flower, about the month of April; and I think always before the usual time for meeting with the larvæ of *Meloë*.

I have found them on various species of bees, usually on those which are most pubescent, as *Andrena fulva*, *thoracica*, and *nigro-anea*; also commonly on *Melecta armata*, *Anthophora retusa* and *pilipes*; this circumstance would appear to confirm, or indicate a connexion between the insects, and from analogy we might readily conclude that this *Pediculus* must be a parasite on some species of bee; but we have nothing in support of this supposition, and against it we have the following observations:—Mr. Newport has shown that it cannot be the larva of *Meloë cicatricosus*, and, as well as myself, has proved that it cannot be that of *M. violaceus* or of *M. Proscarabeus*; and since the only other species of *Meloë*, the *M. variegatus*, does not occur near London, it appears certain that it cannot be the larva of any species of that genus, unless it be discovered hereafter that the larva of *Meloë* not only increases in size in its hexapod state, but that it also changes from bright orange to black.

Another circumstance which induces me to hesitate in adopting an opinion of the *Pediculus* being a larva at all, is the fact, that on opening small cells of *Anthophora retusa*, which I dug up on Hampstead Heath, I found two living specimens of the hexapod in the same cell as the perfect bee; it is certainly possible that they might have subsisted on a portion of the food laid up by *Anthophora*; but here was no change of condition, and how came they into the cell? I am inclined to think that they, being insects in their perfect condition, came there exactly in the same way as we find *Forficula*, having forced an entrance, which I did not observe, and that they were in quest of food, seeking what they might devour.

In the determination of the species of the genus *Andrena* much difficulty will be met with, the similarity of the males of many species being so great, that nothing short of a long and attentive study of them, combined with out-of-door observations, will enable the student to discover those niceties of distinction which are easily detected by the practised observer; these difficulties are considerably enhanced by the changes in colour to which they are subject. The species of the first division which are usually more or less red are very inconstant; specimens of the same species from one locality being highly coloured, whilst those from another have all a tendency to a sombre colouring; those species which have fulvous, or yellow pubescence, are much changed by exposure to light, so much so, that a bright fulvous insect becomes quite grey, or cinereous; it must therefore be borne in mind, that the individuals described are only such as are in fine condition.

The genus *Andrena* contains several species which, in the neurulation of the wings, differ somewhat from that of the type; these will be found to agree with the second type of neurulation, in which the first recurrent nervure is received by the second submarginal cell, towards the second transverse cubital nervure; that is to say beyond the middle. The following species belong to it:—*A. pilipes*, *varians*, *helvola*, *fucata*, *Clarkella*, *fulva*, *Laponica*, *Smithella*, *denticulata*, and *argentata*.

REPORT OF SCIENTIFIC MEETINGS.

ACADEMY OF SCIENCES, PARIS.

SITTING, August 2nd, 1858.—DISEASE OF SILKWORMS.

M. ARMAND AUGLIVIEL writes, that he has examined into the disease which affects silkworms upon different common caterpillars, and that he considers the present epidemic as one of the causes of the very visible diminution, this year, in the number of the caterpillars, which are so injurious to apple trees. This observation is another confirmation of what we have already published, and what has been observed also by several breeders of silkworms, by entomologists, and among others, by Madame Bournay, the directress of the model weaving, in the Hall of Commerce at Lyons, who had attributed, like ourselves, the decrease in the number of butterflies, and other insects, to the effects of the present epidemic. It is therefore evident, as I have before remarked, that the epidemic in silkworms is not caused by ignorance in the breeders, as stated by some scientific men, who have only lately turned their attention to silk-culture; that it is not from mischievous practices that they are suffering at the same moment in France, Italy, Spain, and even in the East, where the worms are bred almost in the open air, and that it is unjust to accuse cultivators of this disaster; for that, the disease, on the contrary, depends upon other causes, among which the epidemic, which destroys both wild and cultivated vegetables, has an active share.*

August 9th.—FROGS IN RAIN.

M. DEZAUTIERE, a physician at Decize, (Nièvre,) communicated an account, which was related to him by an eye-witness of the occurrence. Some years ago, he said, an inspector of highways and bridges was overtaken by a shower, and took refuge in a house. An abundant rain fell; and the inspector, with several dwellers in the house, saw many toads fall from the chimney into the fire-place of the room in which they had taken shelter. The storm passed over, they went out, and the ground was covered with similar toads to those which had fallen upon the hearth.†

August 23rd.—GEOLOGY OF RUSSIA.

THE secretary presented to the sitting Dr. Nordmann, Professor of Zoology in the University of Alexander, in Finland, well known to the scientific world by his travels in the Caucasus and Crimea, his "Micographical Researches," his "Faune Pontique," and many other works upon the lower orders of animals. M. de Nordmann presented to the academy the two first numbers of his last

* Have any of our readers observed this disease among the Lepidopterous larvæ in this country?—ED.

† Notwithstanding this somewhat loose statement, it is now well known that the frogs, or snails, or caterpillars, do not fall with the rain. Frogs and toads always jump about everywhere at certain seasons of the year, after rain has fallen. M. Dezautière does not say what sort of a house his friend the inspector went into. It was probably one to which the young toads had free access.—ED.

work—"Paleontology of Southern Russia." Though Sir Roderick Murchison expressly states, in his "Geology of European Russia," that Russia, from the nature of its surface, does not offer the geologist very abundant stores of fossil remains, M. de Nordmann has found, during a residence of seventeen years on the shores of the Black Sea, in the environs of Odessa, as well as in the tertiary strata of Bessarabia, fossil remains which in richness equal those of Germany, France, and England. The part already published of this work, which has in addition an atlas of twelve plates in folio, for which M. Nordmann has himself executed the drawings, contains a complete monograph of *Ursus Spelæus*, and *Odessanus*. The bones are drawn of the natural size. Amongst those to which attention should be especially directed, are the first or milk teeth, and the os hyoides. In confirmation of what M. M. Cuvier, Goldfuss, Wagner, and Middendorff have remarked, relating to the Bear of the Caverns, M. de Nordmann differs in opinion with M. de Blainville, and endeavours to show that the Bear of the Caverns cannot be considered as belonging to the same species as the living Bear. By way of comparison, M. de Nordmann had at his command a very large skull of the *Ursus ferox*. The second number contains the genus *Felis* and *Hyæna spelæus*, and in the genus *Canis* a new species, *Canis meridionalis*, from the diluvian earth of Odessa; the genus *Thalassictis*, the *Mustelidæ*, and *Lutra pontica*, besides *Rodents* and *Solipedes*, among which M. de Nordmann distinguishes several different species.

August 30th.—ORGAN OF HEARING IN INSECTS.

M. LESPES read a "Memoir upon the Auditory Organs of Insects." From this interesting paper we learn that some little openings observed by Erichson, on the horny covering of the antennæ, and which are closed by a membrane, form these organs. They are the same, but of much smaller dimensions, as the auditory apparatus of the *Decapod crustaceans*, which are also placed upon the antennæ.

M. JOLY read "STUDIES UPON THE DISEASES OF SILKWORMS, AND UPON THE COLOURING OF THE COCOONS BY THE FOOD."

As some scientific men have studied this subject for the first time, and perhaps have been led away by the respect shown to opinions expressed by illustrious academicians, M. Joly positively asserts, with the commissioners of the institution, that there is no direct relation between the state of the leaf and the diseases of Silkworms. The author reviews different morbid phenomena which he has remarked in Silkworms attacked with the epidemic, and which have been before observed by all those who have studied this subject for some years. Thus he has seen moults effected with difficulty; the skin of the head and of the rest of the body partly remaining, without the worms being able to cast it off, closing their mouth and anus; the accumulation of alimentary matter in the stomach, swelling out enormously the anterior part of these sickly worms; the decomposition, more or less, of the coatings of the intestine, the gangrenous spots, the infusoria which we have noticed some years ago, in the blood of the affected worms, the chemical reactions of this

blood, the myriads of moving corpuscles which we observed since 1849, etc. M. Joly thinks, as we do, that these maladies are not contagious, and his experiments agree with our own, in proving such to be the case. Like us he has also given *Muscardine* to these worms, inoculating them with sporules taken from insects very clearly affected, or by pouring these sporules over their bodies, which is equivalent to a species of inoculation. As to the remedies, he has tried all those which have been noticed, except sugar, but equally without success. In short, he ends by the usual recommendations of tending them carefully when young, following nature, etc. The most interesting part of this communication is the following:—"I have repeated the experiments of M. Rollin, on the alimentation of Silkworms by means of *Chica*. It is true that I have obtained cocoons coloured with red, but I have had similar ones by merely painting the body of the worm with colouring matter, at the moment it was going to climb upon the plant. This is a new proof that we cannot obtain from this experiment, or from those analogous to it, by M. Blanchard, any positive conclusion in favour of the so-called tracheal (*peritrachéene*) circulation of insects."

[The above Report is taken from the "Revue et Magazin de Zoologie," for August. These Reports are drawn up by the Editor of the "Revue," and Secretary to the Academy, M. F. E. Guérin-Meneville.—Ed.]

THE BEST MODE OF KILLING LEPIDOPTERA.

BY THE REV. F. O. MORRIS.

I MUST caution the entomological public, those at least of them who are as yet "in statu pupillari," against adopting Mr. Crewe's recipe of the ammonia, in so far as he recommends it as preferable to chloroform. It is an injurious prescription, if its adoption should lead to the discontinuance of the latter. I have sent to him by post, some specimens of moths set by me, taken at random from a "lot" of others killed by chloroform, a few "e multis;" and have asked him whether they are any worse for the operation, and at the same time, whether he can send me any killed after his mode, that are better by comparison for the latter.* Mr. Crewe says that he has "over and over again" killed insects with chloroform, and has "invariably" found that it has turned them so rigid and stiff, that it is "impossible" to set them out properly. I grant that it does make them rigid and stiff, but I deny "toto coelo," that there is any impossibility whatever in getting them right again. If you fail in doing so, the fault is in yourself alone, in ninety-nine cases out of a hundred, for I allow that there may be that proportion of exceptional cases, and not in the effect of the chloroform. A clumsy hand will no doubt fail, but a sixteenth cousin of the "neat-handed Phyllis" will be sure to overcome the difficulty. All you have to do is to get all the fingers of the

* Since the above was in type I have heard from Mr. Crewe in answer to my note. He says, "I cannot but confess that the insects you have enclosed to me are very nicely set, but I return you half-a-dozen which I am quite ready to put against them." They have come safe. Two are well set; they have proper-sized pins. The other four have the pins too large, two of them the wings *hollowed*, and the pins *tumbling forward*.—F. O. M.

left hand cleverly under the wings at the thorax, and so "get round" them, and press them straight back, or rather up, the right hand holding the insect firm by a pin through the thorax, and you will either hear, or if I may so say, feel a crack of the muscles, after which all is right and plain sailing. Even without this, putting the moths into the relaxing-box for a night, for the "cold water cure," will often do much towards a remedy.

Like Mr. Crewe, "I have collected insects for some years," in fact for the greater part of my life, and "I have no hesitation whatever in giving it as my own firm opinion," that ehloroform, "take it for all in all," is by far the readiest, best, and *most humane*, method of killing insects.

As to their coming to life again, after being put into the ehloroform bottle, here again Mr. Crewe is totally wrong, and in fact proves himself to be wrong, for the rigidity he speaks of, is the sign and proof of death, with which I opine their coming to life again is somewhat incompatible, if you leave the moth in the ehloroform bottle for a quarter of an hour.

I say nothing of ehloroform and water, with which no doubt Mr. Crewe has been imposed upon; but with good ehloroform, take my word for it, the insect will never come to life again, not only not nine times out of ten, but not one time. If not rigid, it is because it is not dead, and if not dead, it is because the ehloroform has not been good; but if the ehloroform be good, the moth succumbs at once, is almost *instantaneously* rendered insensible, and if left in that state of coma for the brief space of time I have spoken of, will never flutter or fly again.

As to the alleged superiority of the spirit of ammonia, why, Mr. Crewe himself allows, that in order to secure the death of the insect, you must leave it exposed to its fumes for half an hour; and he confesses, moreover, that so "few"!! as twenty-six species are injured in their colours, (not so with ehloroform,) by the use of the ammonia, to which I doubt not many others might be added; at all events I know this, that "villainous" brimstone, which in like manner destroys the colours of the green moths, destroys also those of some if not all of the brown ones, turning them to a yellowish tint, as e. g. *Eubolia mensuraria*, and so I conclude, by parity of reasoning, it probably is with ammonia. "As at present advised," I feel disposed to say "I'll have none of it." Commend me to the ehloroform, and I re-commend "Willie," and all others "whom it may concern," not to be led away from following the wholesome advice I gave him, by any fear of "coming to grief," which I much misgive me he "Will" if he is so "green" himself as to use the ammonia, either for the "greens" or for any other insects, in preference to honest good ehloroform. As I told Mr. Crewe in my note, his advice is calculated seriously to mislead, and so I now tell my readers.

As to oxalic acid, it no doubt is a deadly poison; I should be very sorry to take a dose of it; but some moths have "nine lives," and nothing so good as ehloroform for their destruction. This very summer I had two huge Canadian moths in ehrysalis here, namely, *Hyalophora cecropia*, which in due time came out; measuring all but seven inches across the wings. I killed them with oxalic acid, but one of them, when I at first thought it was dead, was not, but came to life again.

With regard to the stopper being apt to fly out of the ammonia bottle, and requiring to be tied down, the same takes place with chloroform, when at least the chloroform is good. The best place to get it genuine, is at Apothecaries' Hall. Æther is not chloroform, though I fancy it is often sold for it in the country, and it appears that Mr. Crewe has been "done" the same by.

The best mode of proceeding is to take with you a quantity of chip pill-boxes which may be bought at any druggist's, in "nests" as they are called, at the rate of twelve dozen for one shilling and fourpence. You put the moths either from the tree or out of the net into those, and so bring them home. It is wonderful how quiet and still they keep, instead of knocking about as might be supposed. In the evening they will just move, or perhaps flutter, if you open the lid of the box, but by leaving them till the morning, which is the proper time, for you should never attempt to set a moth by candle, lamp, or gas-light, they will lay perfectly still and motionless, and you can then see which are really worth keeping, and which should be returned to liberty again. The former you shake out of the boxes into a wide-mouthed chloroform bottle, with a few drops of chloroform renewed every now and then as may be required, and filled with small pieces of blotting-paper to absorb any moisture from the chloroform or the moths themselves, and to prevent injury from their rubbing together, and in a quarter of an hour you may safely take them out, "kai ta loipa."—F. O. MORRIS, Nunburnholme Rectory, November 1st., 1858.

Methods of Killing Lepidoptera.—The readers of "The Naturalist" must be much obliged to Mr. Crewe for the benefit of his experience in killing moths, as given at page 261. My experience has caused me to decide in favour of chloroform and a saturated solution of oxalic acid; the former only to quiet the moth, the latter to kill it. A camel's-hair brush dipped in chloroform will settle half-a-dozen moths by inserting a little in each box and closing it tight again. In half a minute you can pin and kill them quite comfortably. I use a sharp-pointed quill, which I prefer to a steel pen, for pricking in the solution of oxalic acid. Mr. Crewe admits that ammonia would spoil many species, and enumerates twenty-six which must not be killed with it; and for these exceptions recommends what I think good for *all*. It appears to me very disadvantageous to be burdened with two sets of apparatus when one set would do, especially when travelling. The time lost in using the ammonia appears to me the great objection to its use. Mr. Crewe says, "leave the moth half an hour exposed to the ammonia." From his own experience, given in the previous number of "The Naturalist," at page 237, a "good dose" for *two hours* did *not* suffice to take the lives of *Rhamnaria* and *Vetularia*. This loss of time would not suit a collector who had been out all day, and brought home a hundred specimens or more, all to be pinned, killed, and set out the same evening. Should there be compensating advantages attending the use of ammonia, I hope Mr. Crewe will make them known.—T. CHAPMAN, Glasgow, November 13th., 1858.

I am a humble member of creation, and as such keep myself to myself, and do not intrude upon my fellow creatures; but I chanced the other day to be present at a large and influential meeting of "bloods," and cannot refrain from giving you an account of it. The assembly consisted of a large number of respectable insects, and when I name the Honourable *Rupicapraria*, the very Reverend the Dean of Westwoods, (*D. applana*), and the various members of their families, as amongst the company, you will have no reason to doubt my assertion. The meeting was held in the branches of the celebrated Calthorpe Oak, more than four hundred persons being present; some sat on the branches, some fluttered in the air, whilst *Mrs. Cynips* and a few more made the most of the opportunity to lay the foundation of another brood. The proceedings were opened by *G. Stercorarius*, the public orator, who declared that "that meeting had assembled for the consideration of the question, 'How best can the insect world protect themselves from the assaults and encroachment of man?'" The discussion was commenced by the afore-mentioned Honourable *Rupicapraria*, who said, drawing in his breath as he uttered the first word, in a manner similar to that in which I have heard members of the House of Commons do, "Sir, man is cruel; (immense cheering, clapping of wings, stamping of feet, etc.) man is arbitrary and proud. (Renewed and deafening applause, in which the *Bombyx* family, so noted for their lungs, took the lead.) Sir, (hear, hear!) Sir, (bravo!) Sir, (excellent!) Who, (in a voice of thunder) who darès to—" (ha, ha!) The speaker could not go on; the excitement was extreme. A thorough search was made throughout the assembly, but in vain. The culprit could not be found; but whether it was that the determination and energy of the constables, *Atropos* and his relations, terrified them, or that the effects of his first offence had satisfied him, certain it is, we were disturbed no more. The proceedings were brought to a close with the utmost order and regularity, and the orator pronounced, with that fluency of speech and elegance of diction for which he is famous, the following resolution:—"That it is the unanimous resolution of this meeting, that in future any insect who allows himself to be caught by man, is a fool."—*CETONIA AURATA*.

Ravages of the Halticæ, (Turnip Flies.)—It is well known that these little Coleoptera, with which agriculturists are familiar under the names of Tick, Plant Lice, etc., are a real scourge to the growers of rape seed, and the cultivators of vines, gardens, etc. This year one of the same species has very much injured our forest oaks, as I have been informed by M. Vicaise, the chief administrator of the domains of the crown, and by M. Pissot, the conservator of the Bois de Boulogne. The larvæ of this species, (*Graptodera eruca*, Fabr.) divest the oak leaves of the whole of their parenchyma, till they appear like lace-work, just in the same way as those of the *Halticæ* attack the vines in the south. All these species so nearly resemble each other in the perfect insect, that they have been blended together by various authors, under the name of *Haltica* (*Graptodera*), the *Oleraceæ* of Linnaeus. I have long hesitated about separating them specifically, merely on account of characteristics of trivial importance, but a close study of their habits, and above all of the larvæ, has shown me that there are many distinct species,

characterised by the larvæ and by different perfect insects. I have endeavoured to define these species in my article "Altise," in the "Encyclopédie de l'Agriculture," published by M. M. Firmin Didot, and I have established two distinct species, for the *Hallicæ* which attack vines, and those which live upon a thistle, very common in the same localities. These are the characteristics extracted in an abridged form from my article:—*Graptodera amphelophaga*.—Larger than the true *G. oleracea*, of a greenish blue colour, and differing from it in the frontal keel of the head, which while it reaches nearly to the edge of the clypeus, is thicker towards the base; and by the anterior angles of its corselet, which are rather enlarged and rounded before, thus forming two little projections. *Graptodera carduorum*.—Smaller than the preceding insect, and larger than the *Oleracea*; of a beautiful shining blue. Frontal keel beginning as high as the insertion of the antennæ, and descending towards the clypeus, ending before reaching its edge at a transverse keel, which is parallel to the clypeus; this keel is thicker above. Anterior angles of the corselet without any projection; punctuation of the elytra delicate and vague, nearly effaced behind, etc. I have given further details of these species, and descriptions and drawings of their larvæ, comparing them with those of *A. oleracea*, in the "Encyclopédie de l'Agriculture."—F. E. GUERIN-MENEVILLE. From the "Revue de Zoologie" for October.

NOTES OF AN EXCURSION TO GLASTONBURY, WELLS, AND THE MENDIP HILLS.

BY W. V. GUISE, ESQ., F. L. S.

It has always appeared to me that there is between natural and antiquarian science, if not a degree of kindred and consanguinity, yet certainly such a measure of congeniality and accordance, as renders the one in a high degree compatible with the other. For myself I may confidently aver, that I have found in the pursuit of antiquities and heraldry, a pleasure only second to that which I have derived from the study of nature herself. Whenever therefore an opportunity offers of combining the two, I rarely neglect to avail myself of it, and thus, when from weather or locality, the one subject of inquiry fails, it seldom happens but that the other affords me ample matter for interest and investigation. It was, therefore, with reference to both these objects, that on the 22nd. of July I joined the members of the Archæological Institute in an excursion to Glastonbury Abbey and Wells, with a view to extending my researches afterwards in the direction of the Mendip Hills, and of examining the Cheddar Cliffs, and some of the more noted caverns with which those hills are perforated.

A tolerably large number of archæologists mustered at the station at Bath, and departed by the nine o'clock train for Glastonbury. The sky

was overcast and lowering, and ere we had reached the Highbridge Junction, gave evil augury for the future, and threatened to throw a damp upon our proceedings, if not upon our enthusiasmi.

From the junction to Glastonbury the rail traverses a perfectly flat alluvial tract, intersected by ditches and streams, and even now so little elevated above the sea-level, that a permanent depression of a very few feet would suffice to restore it to that condition of marsh and lake—"a place for the bittern and pools of water"—such as it doubtless was "in the days that were," ere yet Joseph of Arimathea had set up his staff at Glastonbury, and had obtained from the British king a grant of the site upon which the abbey was afterwards erected. We are told that it was known to the Britons by the name of "Ynswytryn," or the "Glassy Island," and as the place of interment of the renowned King Arthur, it has still a hold upon our imaginations, which Tennyson's noble poem of the "Morte d'Arthur," will never let die.

Our train was slow, and as it passed leisurely along the sedgy banks of the stream which flanked the course of the railroad, I had time to notice many pretty plants, whose blossoms added the charm of colour to the otherwise rather sombre landscape. Every hedge-row glowed with the rosy spikes of the Rose-bay Willow-herb, (*Epilobium angustifolium*), which had evidently found a congenial habitat, and flourished in profusion. The Flowering Rush, (*Butomus umbellatus*), the Arrow-head, (*Sagittaria sagittifolia*), and the Yellow Water-Lily, (*Nuphar lutea*), were amongst the most conspicuous of that fair floral array which

"In every place,
In every season, fresh or fair,
Open with perennial grace,
And blossom everywhere."

The exigences of the rail necessarily limited the time allowed to the archæologists for their inspection of the remains of the Abbey and the exquisite chapel of St. Joseph, together with the Abbot's kitchen and the Tithe Barn, the latter a noble fourteenth century structure, but this scanty leisure was still further curtailed by the unpropitious aspect of the 'skyey influences,' which favouring no longer the happy 'valley of Avilion,' where, as the poet sings,—

"There falls not rain, nor hail, nor any snow,"

poured forth a repeated succession of storms of rain, which upon our arrival at the 'Barn,' increased to a decided down-pour, and put to flight a whole bevy of fair nymphs, who, with garments raised mid-leg high, flitted away to shelter through the long wet grass in a manner remarkable to behold.

Here I bid farewell to the antiquaries, and took flight for Wells, where the examination of the gem of a cathedral, and of the scarcely less inter-

esting remains of the ancient palace of the Bishops, occupied me throughout the afternoon. The garden attached to the Bishop's Palace is kept in most beautiful order, and exhibits many rare exotic trees and shrubs in high beauty and luxuriance, the ample foliage of which, together with the brilliant colours in the tastefully-arranged parterres, contrast most harmoniously with the time-worn walls and ivy-crowned ruins of the ancient episcopal hall.

The range of the Mendips consists chiefly of the mountain limestone, of the carboniferous series, and as is commonly the case in that formation, is perforated by numerous fissures, which at the junction of the limestone with the inferior beds, frequently assume the form of caverns, in which, by infiltration through the calcareous rocks, stalactitic concretions of singular forms are constantly developed.

The cavern at Wookey is one of the most extensive of these "sunless caves," penetrating the rock to a depth of two hundred yards; it is however by no means remarkable for its stalactites, in which respect it must yield the palm to Cox's cavern at Cheddar, which, though small, exhibits, in an exquisite degree, those strange fantastic forms, in which the freakish hand of Nature delights, as it were, to try its plastic skill in moulding shapes the most bizarre and quaint; or in a spirit of humorous travesty, counterfeits objects the most ordinary and familiar, as witness the 'string of five turkeys,' the 'loaf of bread,' and the 'fat goose' in Cox's cavern, which really exhibit a grotesque resemblance to the objects whose names they bear. Perhaps, however, the folds of drapery festooned from the fissures, and so thin as to be transparent, and the stalagmites rising to the height of six or eight feet from the floor of the cave, perfectly cylindrical, and preserving throughout a diameter of little more than an inch, are amongst the most remarkable of these petrifications. But when we come to reflect upon the lapse of time which must have passed since, drop by drop, these marvellous forms have been elaborated, the mind is lost in the vast perspective, and endeavours in vain to realise the moment when the drop of water, which, at intervals of half-minutes, falls 'drip,' 'drip,' upon the apex of that slender column, was first precipitated from the newly-opened fissure above. In spite of the theory of 'prochronism' in creation, I must take leave to entertain the opinion that these concretions date their origin from a period far anterior to the appearance of Adam upon the earth; and yet, geologically speaking, they are of comparatively late date—late, that is as compared with the vast thickness of the underlying strata, since the gravel upon which they rest on the floor of the cavern is undoubtedly attributable to the 'newest tertiary' period.

The cliffs of Cheddar reminded me strongly of those at Matlock, in Derbyshire, to which they bear considerable resemblance, as well in external

grouping and elevation as in lithological character; but they are inferior, inasmuch as they are deficient in the wood and water, which constitute such valuable adjuncts to the picturesque appearance of the latter.

I was tormented—almost past endurance—by a crowd of importunate women and boys, who lie in wait for passengers at the entrance of the defile, and plague them to purchase roots of the Cheddar Pink, (*Dianthus cæsius*), which they cultivate for sale. I believe the plant has been quite eradicated from all accessible stations on the rocks, though doubtless on some of the loftier precipices a few scions of the old stock may yet retain a firm and impregnable hold, where urchin's foot dare never venture, nor hand of botanist intrude.

The Lesser Meadow-rue, (*Thalictrum minus*), grows in profusion upon the rocks, and *Polypodium calcareum* at their foot. *Argynnis Adippe* was in swarms on the upland pastures.

Between Cheddar and Yatton, at which point I rejoined the Great Western Railway, the country is of a highly interesting and diversified character, the road traversing the flanks of the Mendips, which it crosses a little beyond Axbridge, overlooks a wide extent of rich pasturages, level as when the waters of the 'tertiary' sea washed the base of the hills, but having the uniformity of its surface perpetually varied by rounded monticules,—'outliers' of the 'lias' or mountain limestone, which formed islets or shoals in the retiring waters of that ancient ocean. Occasional openings afforded distant peeps of the Severn, and the Welsh hills beyond; while the elevated outline of the Quantock Hills beyond Bridgewater closed in the perspective towards the south-east.

I was greatly struck with the air of comfort and cleanliness in the villages through which I passed, in which the comeliness of the population likewise formed a very noticeable and pleasing feature; for natural beauty is never more admirable than when exemplified in the human subject; but more especially so when it forms the type of a class, and is not the mere distinction of a family or an individual.

With my arrival at Yatton terminated my short excursion into Somersetshire. The district which I visited is indeed full of objects of deep interest, and deserved, had time been permitted me, a more lengthened pilgrimage. I have however thrown together these few notes in hopes that they may interest some amongst the readers of "The Naturalist," to whom the opportunity of visiting these delightful scenes is denied, or may serve to induce others, having more leisure at their disposal than I had, to follow in my footsteps,—in either case this short notice will not have failed of its intent.

Elmore Court, August 2nd., 1858.

Miscellaneous Notices.

Occurrence of the Marsh Harrier on Pevensey Levels.—Mr. Albert Vidler, (an excellent shot and naturalist of this town) shot on Saturday last, October 2nd., in Pevensey Marshes, a remarkably fine specimen of the Marsh Harrier, (*Circus æruginosus*.) It was in very fine plumage. The crop was very much distended with the remains of a bird, apparently a Moorhen. Mr. V. says he has often seen them in the marshes, but never shot one before. The same indefatigable naturalist brought me to-day, for inspection, a fine Lesser Black-backed Gull, (*Larus fuscus*,) shot by one of his father's men the day before, in Pevensey Bay.—JOHN DUTTON, South Street, Eastbourne, October 11th., 1858.

Honey Buzzard.—Captain Richardson's gamekeeper killed at Sutton Hurst, in the parish of Barcombe, on Monday last, a splendid specimen of the Honey Buzzard, apparently a very old bird.—G. GRANTHAM, Hove, October 9th., 1858.

The Partridge.—I have killed on an adjacent estate, in the same parish, several of the Common English Partridge, having a perfectly white-coloured horse-shoe on the breast instead of the usual-coloured one, during the present season. On Wednesday last, I killed in the adjoining parish, Isfield, a white Partridge, the feathers having the usual markings in the same way as a damask table-cloth or the White Peacock; and a brace of Partridges from another covey having the white horse-shoe. G. Molineaux, Esq., of Lewes, had previously killed two white varieties at the commencement of the present season. I know not if the peculiarity mentioned has been noticed elsewhere; none of the Brighton game-dealers have had any specimens, or have they ever seen or heard of such instances before, and I presume it is almost, if not quite, a local affair.—Idem.

Rare Birds.—The following rare birds are in my possession for preservation:—A fine old male of the Pomerine Skua, (*Lestris pomarinus*,) a very rare bird in this quarter: it was found dead on Skipwith Common, and sent to me by Colonel Drummond, who found it there. A fine specimen of the Yellow-Shank, (*Totanus flavipes*,) shot near Tadcaster, by N. B. Thompson, Esq.: it differs a little from the description in Morris's "British Birds," the length being ten inches and a half, weight three ounces, wings, when extended, twenty inches: it is a female, and in fine plumage. A pair of white Partridges, shot at Huggate, by Richard Christie Esq.: they are pure white—not a speck on them. It is very singular that at Kirk Hammerton two white Swallows have been shot by Colonel Thompson.—DAVID GRAHAM, Market Street, York, October 17th., 1858.

The Wood Sandpiper.—A male specimen of the Wood Sandpiper, (*Totanus glareola*.) was shot at Barr, a few miles from here, on the 26th. of August. It is now in the possession of Mr. Charles B. Hodgson, of this town, to whom it was presented by the gentleman who shot it.—HENRY BUCKLEY, Church Road, Edgbaston, Birmingham, October 15th., 1858.

Proceedings of Societies.

Thirsk Natural History Society.—*Botanical Exchange Club*.—The monthly meeting of this Society was held on the evening of Wednesday, the 1st. of September. Mr. J. G. Baker communicated a paper on a *Barbarea* which has been found in several places in the neighbourhood of Manchester, which he identified with *B. intermedia* of Boreau, a plant of France, Belgium, and Italy. It occurs in waste ground and cultivated places, and may be known from *vulgaris* and *stricta* by its *præcox*-like leaves and short styles, and from *præcox* by its more robust habit of growth, and by its closer and more numerous styles, which are only about half the size of those of that species. He explained, also, that *Arenonea agrimonioides* and *Potentilla hirta*, two plants which have been published from Perthshire, had owed their introduction to horticultural operations.

The Querist.

At what elevation above the sea is the Mushroom, (*Agaricus campestris*.) found in the North of England?—On the 11th. of September last, whilst exploring the slopes of Old Cote Moor, near Arndcliffe, in Craven, I gathered several well-grown Mushrooms in the 'rough pastures' just below the 'heather line.' Having the Contoured Ordnance Survey with me, I found that these fungi were flourishing at fourteen hundred feet above the level of the sea, and it would be interesting to know what is the greatest height at which your botanical correspondents have found them.—EDWARD JAMES MAUDE, The Old Hall, Knostrop, Leeds, October 7th., 1858.

Can any naturalist inform me of a good plan of cleaning large shells, to prevent their having a putrid or offensive smell. I have several very large specimens of *Fusus antiquus*, which I cannot place in my cabinet from not being able to clear them thoroughly from smell. I should be glad of any opportunity of exchanging shells.—C. H. BROWN, Southport, Sept. 3rd., 1858.

Can any of our entomological readers tell me what the larva of *Eubolia cervinaria* feeds on, as I have some eggs of the moth, and should wish to know against the time they are hatched.—F. O. MORRIS, Nunburnholme Rectory, November 2nd., 1858.

[The eggs of *E. cervinaria* will hatch, if kept in a cool place during winter, next spring, and the larvæ will feed upon the Common Mallow, (*Malva sylvestris*.) or if this plant is not at hand, they will eat readily the leaves of Hollyhock.—ENT. ED.]



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the earth is full of Thy riches.—PSALM civ., 24.

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Erratum in December No.—“All the fingers” (dele “all”) bottom line, page 283.

NOTICE TO THE ENTOMOLOGICAL READERS OF “THE NATURALIST.”

It will be observed that I am no longer connected with the Editorial part of this Journal. It would serve no good purpose for me to enter into the reasons which have induced me to withdraw my name; but I cannot permit a connection from which I have derived so much pleasure, to close without expressing my sincere thanks to those Entomologists, who, during the past year have favoured me with so many contributions; and I sincerely hope that their zeal in the cause of Science will not relax, and that the pleasure which they derive from its pursuit will make them more and more sensible of its beauties, and more desirous to investigate its truths.

Edinburgh, Dec. 10th., 1858.

C. R. BREE.

TO SUBSCRIBERS.

It having been determined to discontinue “The Naturalist” the Editor has no alternative but unexpectedly to take leave of his numerous correspondents, (no fewer than ninety-two in the past year,) wishing them every good wish, and thanking them for their many valuable and interesting communications.

F. O. MORRIS.

NATURAL HISTORY OF SUNNINGHILL.

BY O. S. ROUND, ESQ.

(Continued from page 271.)

CHAPTER VIII.



BEFORE I proceed again into detail I may as well conduct my readers from the scenes which I have attempted to describe, to those changes which time effects in a wild and open country, such as this was. And now that the glorious panoply of armed hosts had deserted these quiet scenes, no more to resound with the hoarse voice of the trumpet or the shrill neigh of the charger; now that the gallant throng of mounted Nimrods, led by their fine old monarch, with his burly presence and sonorous voice, from which the ample and laced coat, the cocked hat and wig, detracted nothing, had ceased to sweep the plain to the clear music of the hound or the cheering cry of the huntsman, a change came o'er the scene, and that free air of liberty and wild unrestraint which had so long marked the region for its own, was doomed to be for ever banished. An act was passed for inclosing the royal forests, and as these plains were considered within the limits of that of Windsor, they were included in its operation. Several wealthy individuals became large purchasers of the crown lands, and to one in particular, who possessed already a park, situated between that portion called "Beggar's Bush" and that designated "Cheapside," nearly a thousand acres of the waste was allotted. My grandfather, among the rest, obtained a grant in respect of his cottage residence and clump of beeches. Some allotments were made to St. John's College, Cambridge, and the Bagshot Estate, and government allotments monopolised the rest of the open ground, the morasses, which I have particularly spoken of, being reserved to the parish of Sunninghill, for the use of the poor, and to remain unappropriated for ever.

These proceedings were a sad blow to many of the lower class of inhabitants, who had hitherto lived, it must be admitted, in a very lawless manner, little better in their ideas of right and wrong than the merest savages; they had roamed at will over the whole expanse of moor; shot, for being free forest it could scarcely be called poaching; hunted, cut turf or heath, or, in fact, did whatever they listed without being in any way called to account for their actions, and therefore when an ownership was exercised over it, and they could no longer enjoy their accustomed immunities, they felt it deeply. Nor did they succumb without a struggle, indeed it was long before the law being put in force, could convert them into civilized subjects. Time, however, has now worked its way, and although up to a late period there was a sad set of

poachers and vagabonds, who lived no one knew how, (although they shrewdly suspected,) the race may be said to be nearly extinct, and the numbers are no greater than are usually found in every village.

The appropriation and division of the common ground soon shewed itself; workmen were employed to throw up banks, sink ditches, and plant the crowns of the hills; and broad belts of incipient woods formed lines of demarkation, and of course on the government property this was on a large scale, but not until many years after, although the government banks were "stickers" to the followers of the chase, and it took a bold man and a good horse to jump them. The greater part of Sunninghill was purchased by a gentleman named Simpson, an East India merchant, and formed an estate known as Sillwood or Sellwood Park, containing about eleven hundred acres, nine hundred of which were waste; this was laid out with admirable taste, and was kept up for many years in beautiful style: it has since changed hands, a railway bisects it, and all those changes which years effect have taken place. The village, then consisting of but a few houses very much scattered, has become tolerably populous, the people not being remarkable for any particular trade, except that, I grieve to say, in common with many others in England, the "Beer Act" has had the most baneful effect, and "Tom-and-Jerries," as they are familiarly called, have spread drunkenness and ruin chiefly among the youth of the parish. Of course there are the usual amount of small shops, and one of some pretensions, established in 1780, could produce, I believe, any article you chose to ask for in any department, commencing with "Irish Butter" and ending with "Books Neatly Bound!"

The view from some parts of the village is exceedingly picturesque and extensive, looking into the Surrey country from Epsom Downs to Guildford, which is hidden from the prospect of the village itself by some high heath hills, known as Ribsdown; from the summit of these the view is almost unrivalled. You appear to look down into a garden, the fields around and beyond the town of Chobham being seen in miniature from that elevation. Guildford with its ancient towers of St. Mary's and Chantry Down is distinctly visible, and you look along the whole ridge of hills covered with cultivated fields, which extends to the "Devil's Punch Bowl," and then "Hind-head" and "Black Down," and known as the "Hog's Back." To the west and north you look over the whole expanse of moorland country which I have described, and beyond it rise the blue hills of Buckinghamshire, marked by the hill above High Wycombe and those eminences which lie just within the boundary of Berkshire, at a place called "Wargrave," near Henley-on-Thames. North-east, Windsor Park looks like a soft moss-bed, and west rise the rugged and pine-clad ridges of Bagshot Park. Due east the valley where London lies may be

distinctly traced by its film of vapour rising as from a cauldron, and a nice hotbed of iniquity it is. To the left of Guildford, Leith Tower and the large group of beeches on Hedleigh Down are distinctly visible; and over the Bagshot Hills Crooksberry Hill, near Waverley, in Hampshire, rises in the blue distance.

ON UNITY OF SYSTEM.

(Continued from page 106.)

THE observations on this subject offer the following conclusions or suggestions, which may afterwards be more fully illustrated—There is one Supreme Deity who fills all space and all creation, to whom belongs all power, who never changes, and of whom is all creation and every single creature.

Accordingly it is stated that the existence of all the visible creation, and of every creature separately, begins in the Deity and ends in Him; and thus the present life of each is imperfect, both in itself and as forming only the middle part of the system, the beginning and the end being wanting. The Deity still continuing one, and His power in every creature not being separate from Him, it may be inferred and is clearly proved by observation, that every creature exhibits in itself the whole system, though as variously as the structure is various,—thus illustrating the beginning and the end in combination with the middle part. This Being, whose perfection is infinite, is thus the source of all, and why all creatures do not share His perfection, but are all variously imperfect, is a mystery for which there is no explanation but by the Bible, where it is partially revealed.

The present creation, by which time and space are measured, may be said to hide eternity and infinity, which are wholly incomprehensible as such, and cannot be manifest until it cease. Though the term millions were continually doubled in speaking of the ages of creation, still time, when so measured, is wholly distinct from eternity, as it can neither add to nor diminish from it, and the same may be said in reference to the distinction between space and infinity. The term millions of years may comprehend some of the later and shorter periods of creation, but the earlier epochs were exceedingly longer, so as not to be definitely expressed by numbers, and the changes since the creation of man have been successively more rapid.

The system of creation, wholly and in all its details, or collectively and particularly, was pre-ordained before the beginning of creation, and all the events of the same, from the beginning to the end were foreknown, and

have perfectly conduced to the end purposed. The perfect simplicity of this system is evident, and the greatness of the wisdom and of love displayed therein will be more apparent in proportion as it is more deeply studied. The Bible comprehends the outline of nature and of the history of mankind from the beginning to the end, and both it and creation and human history are full of figures and illustrations of the whole system, or of the present life and creation as the middle part, and of the eternal life as the beginning and the end, by which and for which nature exists, and to which it will be transferred.

The system or ordaining of creation commenced with the distinction of the eternal life from the source, and will end with their re-union, and some part of the present creation will then be in the place of eternal life with relation to the source. The next process was the predetermination of the suppression of the eternal life, and the whole order of the creation which ensued is dependent on or in subjection to this previously-formed plan, and all the parts and occurrences in creation, past, present, and future, were wholly foreseen, and are all conducive to the end of the suppression of the eternal life. The term "suppressed," or "slain," may be better understood by describing the eternal life as converted or changed into the natural life, and then assimilating or organizing matter for the various forms in which it appears. The bodies of all living visible creatures are adapted to and organized by this spirit in its natural state, which may be termed a divergence from the eternal life, the latter continuing suppressed in it. By this suppression the creature is wholly distinct from the Creator, who alone opens the communication whereby the suppression ceases, or the conversion of the natural life into the eternal life begins.

All creatures (plants, animals, man,) have a common origin, from whence they are gradually distinguished by their organism or acquisition of character, and all divergences and their consequent degradations are necessary for the development of higher degrees. The structure of all kinds of creatures is alike at the beginning of their existence, and the difference between the highest and the lowest in their perfection consists in the structure of the highest being wholly undeveloped and invisible in the lowest, while the structure of the lowest is wholly degraded and partial in the highest. As all the early epochs of creation were subservient and necessary for the establishment of the later periods, and all of them requisite for the present one; so also all the epochs of mankind, and the successive progress and removal of nations have conduced to raise man to his present level.

As before observed all nature is full of more or less complete illustrations of the whole system of creation, and the beings of each epoch

represent each dominant nation, and the power which is destined to succeed it; one group of creatures being wholly developed and supreme, but afterwards degraded and dwindling away, while some of those which were in subjection represent another group, which in their turn are developed and predominant. There are properly no degrees of perfection in the range of creatures; the development of each kind and that of each class is by a divergence, and they are not only brought on one level by having a common origin and a common incipient structure, but the peculiar perfection of each species or class is degraded in the species or class which is immediately superior to the former. This plan is continued throughout the range, the development in every division being by divergence, and the elaborate structure and beauty of the lower classes being more and more obliterated in the successively higher classes up to man. Thus the higher creature not only passes through a transitory state, which is permanent in the lower creature, but combines in itself the structures of all the creatures below it, and in man, as the highest, all created life is concentrated, and in him all other visible creatures are degraded or brought back from their several divergences.

The interest in the knowledge of all kinds of creatures may be much increased by the fact of their all being manifestations and progressive means of the one spirit, and that each kind has its perfection, which character diminishes more and more in other creatures in proportion as their structure is more remote from that of the above kind. This change in the structure of a creature is attended with a proportionate change in its impulses, habits, circumstances, and its consequent use in creation, thus proving that the variation of the spirit, whether its manifestation be defined as reason or as instinct, or described by some other name, is wholly dependent on organization.

THE ENVIRONS OF BATH.

BY T. FULLER, ESQ.

(Continued from page 224.)

IF any readers of "The Naturalist" have favoured me with their company thus far, they will have seen that there is no pretension to give any topographical account of the Environs of Bath. The only purport of these crude remarks being that of noting down such features in Natural History as might occur in various rambles, and appear to an admirer of nature, like myself, worthy of communication.

The swallows appear now to have all arrived, and are busily and usefully employed throughout the long days. The swifts are very numerous,

and most conspicuous. On the afternoon of the 25th. of May, in my walk by the side of the Avon, beginning with the point where Loek's Brook joins, and following the towing-path down the river, my attention was attracted by the number of these birds. The country-people here call them "Screechers," or "Screech Martins." The difference in their motions on this occasion from what I have previously observed upon their first arrival and up to the present time was very remarkable. They were then silently and swiftly cutting through the air, and skimming over the fields in graceful sweeps and turns in pursuit of food. Now they were darting and wheeling in flocks, with shrill screeching notes, thrilling upon the ear as they rushed past with the rapidity of lightning.

On the opposite side of the river is the parish of Tiverton, and at a short distance below is the village, with its large clothing manufactories close to the water. The machinery of these establishments, and of other mills on both sides of the river, is driven by the power of two water-falls, produced by two weirs built across the stream; over these weirs the river tumbles in white foam and continued roar. For the purpose of carrying on the navigation traffic a canal is made to avoid the weirs, with suitable locks for raising and lowering barges from one level to the other. This canal is cut through the land on the Weston side, and the piece so separated is called the Weston Island. The towing-path being by the side of the canal, the pedestrian in his progress down loses sight of the river and of the upper weirs, which are hid from sight by the buildings and trees upon the Island, and it is not until he arrives at the lower end of the canal, where it again joins the river, that a view of the lower weirs is obtained, over which the river is seen tumbling in one broad sheet of white foam. The appearance of falling water is an agreeable addition to a landscape, and the sounds of this and the upper weir mingling together are pleasing and soothing to the ear; the spectator hesitates to leave so attractive a spot; but upon this occasion my attention was diverted by the noisy active motions of the myriads of swifts, as they chased in flocks over the broad basin into which the river tumbled, their dinning screeches were heard above the roar of the waters. After watching them for some time I resumed my walk down the towing-path. The village of Tiverton terminates at the lower weir, and is followed by a thick plantation of forest trees, rising in bold elevation to the summit of a commanding hill.

The beautiful variety of shades in the different species of firs and other trees, with their tops shewing above each other as the hill rises from the river like an extended amphitheatre, is seen with great advantage from the towing-path, and at this time with additional pleasure from the chorus of the feathered inhabitants, which floated in the clear air across

the water, and became more distinct as the distance from the water-falls was increased.

Surely, thought I, the Nightingale must be amongst these numerous musicians, and during the charm which now prevails his notes will be heard more distinctly nearer to the wood; but to get there the river must be crossed. There are two ways of accomplishing this, one of which is to follow the towing-path to a stone bridge a considerable distance down. The other is to turn back and cross over by a ferry a little way above the place where the canal first branches off from the river. The first route is the most attractive, the winding course of the river, skirted on the north side by the rich woods and plantations of Kelston, presenting endless variety of charming views at every turn of the stream; but having already taken the reader in this direction, and as the sun is now nearing the horizon, and will have disappeared before so long a walk as to the bridge and back on the other side to the desired spot, can be accomplished, we will adopt the latter route and haste to the ferry above. This is soon done. The ferry-boat is moored on the Tiverton side, but there is no delay, for at the first summons a lively old woman issues from the house, wipes the washing-suds from her arms, and trips into the boat. This ferry being near the fork of the river and canal, the water is necessarily broader than at other places, and the current of both streams being arrested by the weirs and locks, the surface, unless agitated by wind, is tranquil. On this occasion not a breath of air was stirring, and the water was smooth as glass. The ferry-rope passed rapidly through the old lady's nimble fingers, the boat glided swiftly over the placid stream, and soon returned with me to the Tiverton side.

The road through the dusty village of Tiverton seemed unusually long, but the fatigue of the walk was amply rewarded upon arriving at the plantation. The sun was still above the horizon, shining with unclouded splendour. A perfect charm prevailed, the plantation rung with every variety of note, Blackbirds and Thrushes were in full song, every now and then a restless Cuckoo, after shifting from tree to tree, would issue forth and flap his long body over to the Weston side. As the sun gradually disappeared below the horizon the tops of the trees retained for some time a golden tinge, slowly lessening to a thin crimson-tinted fringe upon the top of the hill, which passing away, soft twilight crept over the scene. The Blackbird now changes his note to the harsh chirping call to nest, other birds become silent, and the song of the sweetest of all our warblers is heard in perfection, there is no mistaking his "jug, jug."

After listening for a considerable time, delighted with the wild notes of several Nightingales, as they answered each other from various parts of the plantation, I returned my way back through the village, and was

again ferried over the river. Tranquillity still prevailed; the sky bright and clear; the moon, nearly at the full, shone with silvery lustre; no mist or vapour hung over the river or meadows. It was scarcely twilight, and every object around could be distinctly seen. Numbers of birds were still flitting over and about the river, but I did not notice them particularly until after quitting the boat, when I was puzzled in thinking what species they could be of; surely not of the Swallow tribe, although they wheel about and flit upon the water, their motions are different and slower; besides, thought I, my friends the Swifts must be all thoroughly tired and gone to rest. Upon closer observation I was satisfied they were all Bats. I never before saw so many of these animals at one time—where could they all have come from? Probably they all congregate under the extensive roofs of the clothing mills, or in the deep banks of the river and canal, and are now induced to come out by the fineness of the evening. They appear to me larger and longer in the wings than any I have noticed before. I must inquire more about these same Bats.

REMARKS ON THE ROCK DOVE, WITH REFERENCE TO ITS CLAIMS AS A SPECIES.

BY HENRY PAYNE, ESQ., M.D.

IN the domain of ornithology there is no more difficult question for the naturalist to determine than the differences of species, so endless is the variety one meets with in particular species. There are birds marked as distinct from each other, on apparently fallacious grounds, and when I read the descriptions of them I think I see a well-defined species; but after maturer study the supposed species dwindles into a mere variety. This has been particularly the case with the so-called Rock Pigeon, a variety of the genus *Columba*, which may be traced to the agency of arts, under whose tuition nature can assume we know in this genus and the allied gallinaceous birds, variations in shape, size, and colour, which never fail to delight every one, but which lead the scientific inquirer sometimes into a labyrinth of perplexities and “historic doubts.” Should a bitch by any accident lose her tail, she may have puppies without tails, but we have no right on that account to proclaim the occurrence of a new species. Most of the wild or farm Pigeons have a white patch over the loins—a mark of domestication, but all are not so distinguished. You shall see some of the brown ones and dark blue ones without a single white feather over the rump. Besides if so trifling a mark is to be taken as diagnostic of species, we shall have no end of them. The little Sparrow-Hawk, with plumage like a Cuckoo’s, and no brown about it, would rank as a separate species; so it

might be said of the Ring-necked Pheasant, common in certain districts.

Formerly a Wild Cat was described and figured of a beautiful striped grey colour. Now you will be told that Wild Cats are found grey and white, yellow, or black; whereas the truth is that "Wild Cats" of these piebald colours are, to use a botanical phrase, "Garden escapes," although leading a life *naturá fera*, and not the British Wild Cat, but hybrids of domesticated sorts, possibly of them and the Wild Cat.

We cannot allege any difference between the Rock Dove and Stock Dove in the matter of perching, for I have repeatedly seen our farm-Pigeons, which are the Rock Doves, perch on the large branches of our forest trees. Again in the choice of a place for building you will find the Stock Dove generally selecting a bank for its nest, and sometimes the hollow of a tree. True, I am not writing from experience, for never having seen a Stock Dove, if our Rockier be not one, I possess no means of ascertaining the fact, or its real place of abode and nidification. Not having therefore practical experience, I can only indulge in theory to clear up a doubt which has long been on my mind as to the identity of "a Pigeon building in caves, and never alighting on trees." I feel some hesitation in indulging such a doubt. There is something so pleasing to the imagination to hear speak of "a little blue Pigeon never alighting on trees." Apropos of its littleness about which any one versed in the Rock Pigeon theory will tell you is a characteristic mark; go to the "History of British Birds," you will there see, under the head Stock Dove, "Male, length one foot two inches;" under the Rock Dove, "Male, length one foot two inches." The histories also say that the Rock Dove has a patch of white over the tail. Mine, which came direct from Robert Dunn, of Stromness, hold it in what attitude you choose, and I have for this reason set it flying, shews no white feather at all; all the feathers, from the shoulders to the tail end, (where they are dark grey,) are of a pale blue colour. I know of only one station for the "Rock Dove" in this locality, and that is the limestone cliffs at Wentvale, about four miles from Pontefract, where they breed.

Were I to be shewn a blue Wild Pigeon, with a white rump, I should say that either it or its progenitors had been bred in a dove-cote, but was of Stock Dove extraction, which is probably the origin of our blue Pigeons, wild and tame. This white-rumped blue Pigeon, that breeds in our sequestered rocks, banks, and caves, be they of chalk, lime, or sand, be they high or low, by the sea or inland, has, I dare almost affirm, Stock Dove blood in his veins. Either the older naturalists have overlooked it as a variety, or it has taken up its abode exclusively in rocks, only because it has been taught to live amongst stone and lime by its protector man. I incline however to the latter opinion, and must do so till we can discriminate between it and the Stock Dove. He is in short a cosmopolite dwelling in a bank, a cave, or a tree, as fancy leads. Thus in this part

of the country he usurps the right of his ancestor the Stock Dove, who, amid all our flights and sights of the Pigeon tribe, is never heard of, because the claims of the latter have been set aside by a petted upstart and pretender.

Barnsley, 8mo. 27th., 1858.

[I cannot coincide with Dr. Payne in the opinions he has expressed about the Rock Pigeon. I do not see how the "agency of arts" can be traced in a thoroughly wild species, nor can I consider the white mark over the tail a "trifling" difference. If, in the wild bird, to say nothing of the domesticated one, the mark be "*semper, ubique, et in omnibus*," it is amply sufficient as a specific distinction.

I do not understand the remark about the Sparrow-Hawk. I suppose Dr. Payne does not mean to assert that it too is not a species; neither can I understand how he can "think he sees a well-defined species" on "apparently fallacious grounds." Dr. Payne says that he has never seen a Stock Dove, unless the Pigeon that builds in cliffs near Pontefract be one, (which I am confident it is not,) and yet he asserts that it generally builds in banks. It does build in rabbit-holes sometimes, but he does not name these, and I am aware of no authority for the mere bank. I think he never heard of the tame Pigeon doing so, which on his theory it ought to do. As to the notion that the young of a dog which had lost its tail, might possibly for that reason be tailless also, I think I need say nothing.

As to the so-called Wild Cats, I should suppose that no one, not pretending even to be a naturalist, would confound the common Domestic Cat run wild with the Wild Cat, "figured," and properly figured, "of a beautiful striped grey colour," beyond allowing that it had originally come down from that stock. Again, if Dr. Payne quotes from my "*History of British Birds*," his quotation of the relative size of the Stock Dove and the Rock Pigeon is not quite correctly given, the length of the latter being "one foot one inch to one foot two inches," which is not absolutely the same as "one foot two inches." The habits, I may add, of the two birds are totally different. I can only suppose that those which Dr. Payne has taken for Rock Pigeons, breeding near Pontefract, in the West Riding, may be tame Pigeons escaped from dove-cotes, which have taken up their abode there, and recovered somewhat of their original nature and habits, those of the Rock Pigeon. Lastly, I cannot understand what Dr. Payne means by saying that the older naturalists have "overlooked as a variety" a bird which they have described as a distinct species; nor again how the Rock Pigeon can have made the rocks and cliffs its dwelling-place because it has been "taught to live amongst stone and lime by its protector man."

—F. O. MORRIS.]

LIST OF LEPIDOPTERA OCCURRING IN THE COUNTY OF SUFFOLK.

BY THE REV. JOSEPH GREENE, M.A., ASSISTED BY THE REV. H. HARPUR CREWE, M.A.,
AND C. B. BREE, ESQ.

[The portions of these papers contributed by Mr. Crewe and Mr. Bree, are signed with the initials C and B respectively. N.B. at the head of a paragraph signifies that the remarks are made after those of Mr. Greene.]

(Continued from page 255.)

91. *T. cruda*.—Common of course. The caterpillar is very deceptive, at least in *my* case. The first time I found it was at Brandeston. It fastens two leaves together, lying curled up between them during the day-time. I thought it must be, at least, a good *Ceropacha*, and went on collecting them till I had "amassed" about two hundred. I shall not soon forget my disappointment, as day after day, my friend *Cruda* emerged. My suspicions had already been grievously excited, by observing that the larva entered the *earth* to effect its transformation; the whole of the genus *Ceropacha*, if I mistake not, spinning up between leaves, or in moss, etc. The larva is extremely variable, and though preferring oak, will readily feed on hazel and sawlow. The pupa may be found from the beginning of July to March.

N.B.—This larva appears more than any other to delude and annoy the collector. The protean variety of its colours beats all description. I found a variety here this year and last, which was pale green with a very pretty orange and red spiracular stripe. I thought I had got something good, and was most horribly disgusted when I discovered my mistake. In addition to its other troublesome qualities the wretched larva is a cannibal. (C.)

92. *O. upsilon*.—Extremely abundant at Playford, occasionally coming to light. I found the larva and pupa in the utmost profusion under decayed bark on willows and poplars, especially the former. Where no loose bark occurs, they enter the pupa state at the roots. The insect evidently prefers damp localities, in fact, I never met with it elsewhere.

N.B.—I have taken the larva of this insect in some numbers near Stowmarket, when sugaring just after dark, crawling up the pollard willows, and occasionally upon the stem of the black Italian poplar. It conceals itself during the day amongst the grass and roots at the foot of the tree, or under a piece of loose bark, and as soon as it gets dark, climbs up to feed on the leaves. It is a dark dingy blackish larva, and is full-fed about June 7th. It feeds most voraciously, and attains its full size with marvellous rapidity. It remains a very short time in the pupa state, sometimes barely three weeks. In confinement all my larvæ buried, and spun a cocoon under the surface of the soil. (C.)

93. *O. lota*.—Also common in the larva state. The egg would appear to be laid on the bud, as the larva is almost invariably found among the young

tender leaves, spinning four or five of them together when young. It afterwards conceals itself, eating only at night. It is a most voracious feeder. As a rule, I should say it prefers willow to poplar; I have not met with it on poplar.

94. *O. macilenta*.—Twice met with in the pupa state at Brandeston, and once at Playford. It is, I think, a rare insect in Suffolk. Freyer gives beech, (Manual, p. 246,) as the food of the larva. I should say birch, my pupæ being all found at the roots of that tree.

N.B.—I never met with this insect in Suffolk, but have taken it at sugar in Derbyshire and Hertfordshire, in October and November. It appears to be uncertain in its appearance. In 1854 I took it in the utmost profusion in the latter county, whilst the following autumn, though I sugared quite as diligently, scarcely one was to be seen. I do not know the larva. (C.)

95. *A. rufina*.—Rare. A few taken on nettles at Brandeston; among them was one specimen nearly black.

96. *A. pistacina*.—Common.

N.B.—I took the larva of this insect in some plenty this year, (1858,) at the end of May and beginning of June, by sweeping the mowing grass in the meadows round Stowmarket. It closely resembles the larva of *Hadena oleracea*, and is sometimes bright yellowish green, and at others reddish brown with black spots. It feeds voraciously upon the leaves of the three common Meadow Crowfeet, *Ranunculus bulbosus*, *acris*, and *repens*. It spins a very tight, neat earthen cocoon, in which it remains some weeks before assuming the pupa state. This cocoon when kept dry becomes exceedingly brittle. The eggs which I have had are laid in the autumn, and hatched in the spring. (C.)

97. *A. litura*.—Common. Frequently bred off willow.

N.B.—I have very frequently beaten this larva from oak, and bred the perfect insect. (C.)

98. *G. vaccinii*.—Common. During a recent visit to Suffolk, I dug up three pupæ at the roots of an elm. I never met with it in that stage before.

N.B.—I have bred both this and the following species from some dingy dirty brown larvæ, found feeding inside the catkins of willow in May. I have also bred the latter species from larvæ beaten from white thorn. (C.)

99. *G. spadicea*.—Common.

100. *S. satellitia*.—Plentiful. The larva of this species is very singular in its habits. I do not allude to its carnivorous 'propensities.' In this respect unfortunately it is *not* singular. Sometimes, when young, it feeds on trees, and afterwards on low-growing plants; at other times it appears to invert this order of things. I found a number of them last spring about half an inch long, feeding on the common primrose, but when placed in a box, containing leaves of the wych-elm, they immediately forsook the former and devoted their energies to the latter. Conceals itself during the day.

N.B.—I shall not easily forget the feelings of delight with which I captured my first beautiful black velvety larva of this moth, nor my feelings of disappointment when the perfect insect appeared. It is one of the most beautiful and uncommon-looking of all our British larvæ. (C.)

101. *X. citrigo*.—This highly interesting genus is well represented in Suffolk, as I have myself taken the whole six species. I bred the above several times, beating the full-fed larva from a lime in my garden at Playford. This appears to be a suitable place to make a few remarks on the habits of the larvæ of this genus. The general opinion seems to be, that when young they feed on the seeds of various trees, and afterwards leave them for various low-growing plants. That this is by no means necessarily the case, I have had abundant opportunities of proving. For instance, *Citrigo* was nearly full fed when beaten from lime, and in confinement they not only preferred that tree as food, but would not touch any other. At Playford I beat the larva of *Ferruginea* in the greatest profusion from the wych elm of all sizes, from a week old to their full growth. Again, the five pupæ of *Gilvago*, which I dug up this year in Derbyshire, were all at the roots of elm, there being no plants at all near. The same remark applies to *Xerampelina*. Indeed, with regard to this latter insect, I entertain little doubt that leaving the tree is the exception and not the rule. I must at the same time acknowledge that I have not succeeded in finding the larva. I am very anxious to know farther, whether the eggs of the different species in this genus hatch in the autumn or not? I believe the general idea is that they do not. My own impression is that they *do* hatch and hybernate. My only reason for thinking so is, that last month (October) I found, in beating some loose grass, weeds, etc., in a very small plantation, two larvæ of this genus, about half an inch long. I cannot state the species, as there were both ash and elm in the plantation, and the larvæ (when young especially) are so much alike, that it is difficult to discriminate them. My notion, therefore from this circumstance, is that the eggs are hatched in the autumn on the trees, and that just before the leaves fall the larvæ descend to hybernate among the weeds, etc., and in the following spring ascend them for the purpose of feeding again. This idea is much strengthened by the fact that *Ferruginea* (the only species, unfortunately, I can speak of from experience) may be found nearly three-quarters of an inch in length, when the buds of the elm have scarcely burst. These remarks are only intended to provoke inquiry, and I shall feel grateful for any information on the subject.

N.B.—I have not very frequently beaten the larva of this insect from lime in June. It is extremely liable to ichneumons. I have also dug up the pupa at the foot of the same tree, which is, I am convinced, its exclusive food. It is bluish grey, with a whitish spiracular line, and white and black dorsal dots. (C.)

102. *X. cerago*.—Scarce. On nettles. Brandeston.

103. *X. flavago*.—Not uncommon at Brandeston, at sugar and on nettles. I have frequently beaten the perfect insect from hazels. I bred some fine specimens this year, the larva feeding on primrose.

104. *X. aurago*.—Once beaten from an ash.

N.B.—I have very frequently seen this insect in Bucks. and Herts., flying rapidly backwards and forwards in the sunshine between four and five p.m., on the outskirts of the beech woods. These counties appear to be its head quarters. Maple, the food-plant of the larva, abounds in all directions. The

perfect insect is fond of resting in the day-time amongst the leaves of the ash, from which tree almost all my specimens were beaten. The rest were taken at sugar. (C.)

105. *X. gilvago*.—I did not meet with this species while residing in Suffolk, but during a recent visit at my friend's, the Rev. H. Bree, of Woolverstone, I dug up one pupa.

N.B.—This insect is by no means uncommon in the midland counties. I have taken it rather freely in years past in Derbyshire at sugar. (C.)

106. *X. ferruginea*.—Larvæ in great profusion on the wych elm, as noted above. I gave a description of it, (Int. June 20th., 1857,) supposing it to be *Gilvago*. The description given by Treitschke (Manual, p. 253,) is very inaccurate, and might do for anything. I do not know how it may be on the continent, but I am very sure that in this country the larva does not feed on the seeds of the *poplar*, but on those of the wych elm.

N.B.—I am myself inclined to think that the eggs of this insect do not hatch till the spring, and that if the larvæ hatch before the buds burst, they feed upon the bark of the twigs, which is rendered quite soft and tender by the rising sap. I have not unfrequently seen larvæ in the early spring feeding on the young bark of various trees and shrubs. The larva of this insect, like that of *A. pistacina*, does not assume the pupa state for some weeks after it has spun up. It feeds freely upon the seeds, and if they are scarce, upon the leaves of the wych elm. (C.)

REPORT OF SCIENTIFIC MEETINGS.

ACADEMY OF SCIENCES, PARIS.

FROM THE "REVUE DE ZOOLOGIE" FOR SEPTEMBER.

SITTING, September 6th., 1858.

M. C. BARNARD read a memoir on the quantity of oxygen contained in the venous blood of glandular organs during functional action and during repose, and on the employment of oxide of carbon for determining the proportions of oxygen in the blood.

M. Le Baun Seguir detailed the result of his *experiments by means of the apparatus for artificial incubation*. This apparatus consists of a central stove, (poêle,) surrounded by a number of nests, each covered by a caoutchouc bag, connected with the stove by two tubes of the same material. The water is warmed in the stove by charcoal, the combustion being regulated by the "pyrostat soREL;" the liquid circulates incessantly from the stove to the nest and back again, to take up the little quantity of heat dispersed in the incubation. The circular movement continues as long as there is any charcoal in the apparatus. The capacity of the charcoal receiver has been so calculated

as to provide for combustion for twelve hours. This stove was surrounded by eight nests, each containing twenty-four eggs.

At first M. Le Baun Seguir found that the eggs did not receive the humidity from his apparatus which they would have had from the mother, but he entirely met the difficulty by constantly sprinkling water in the apartments where the apparatus was fixed, and then the young came out of the eggs perfectly developed. [This precaution has also been found necessary in hatching the eggs of silkworms, and our entomologists will recognise the principle in the treatment of their cocoons.]

M. Leon Soubeiran read a paper upon his "Researches into the Structure of the Venomous Apparatus of Vipers." The venom is *Gland composite*, like a bunch of grapes. The acini are very distinctly seen dispersed regularly along the excretory canals, like the beard of a feather on the two sides of its stalk, or like the folioles of a pennated leaf. The lobules forming the gland are from six to eight. Towards the middle part of the excretory canal, a little below the inferior edge of the orbit, is an ovoid swelling, which appears to be a sort of reservoir of the venom. This swelling is very visible to the naked eye. It varies much in size, according to that of the individual and the liquid it contains. Under the microscope it is observed to be surrounded by a number of simple follicules, which all terminate in a single mouth in the cavity of this swelling, (*reuflement*), and form a special apparatus not hitherto described.

M. L. Soubeiran thinks that the venom is secreted as the animal requires it, (and not contained, as supposed in a special reservoir,) just as the saliva is augmented in secretion during eating. If the liquid secreted does not flow continually by the fang-canal, then it must be that the fang, doubling itself back along the maxillary palate bone, makes a fold in the direction of the conduit, and so closes up the canal by pressing its sides together. When, on the contrary, the fang is unfolded, the fold disappears, and there is then no longer any obstacle to the flow of the venom.

SITTING, September 20th., 1858.

M. CICEONE read a paper on the "Researches into the Maladies of Silkworms," which was corroborative of much that has been previously advanced by M. Guerin-Meneville, and opposed to those of M. O. Quatrefages, on the nature of the spots which are the result of *gattine*.

[This subject is one just now of intense interest in France, in consequence of the magnitude of the interest dependent upon it.]

SITTING, September 27th., 1858.

M. VANNER read a paper upon the "Forces which concur in determining the circulation of the blood." These forces, M. Vanner says, are:—1.—A force primitive and unknown, which we find in the egg before the formation of the heart. 2.—The contractive action of the heart on the blood and arteries. 3.—A general compression, which acts in a sense contrary on the blood in the capillaries and veins.

The rest of the sitting was occupied in deciding a question of literary priority, of no interest to our readers.

C. R. B.

A NATURALIST'S RAMBLE ON THE EXMOUTH COAST.

BY MR. EDWARD PARFITT.

THE other day myself and a friend took the first train, at seven o'clock, a.m., to Starcross, and from thence crossed over by the steam-boat to Exmouth, intending to make our way towards Salterton, along the cliffs, to entomologise and botanise as we went along, my friend being fond of plants, (he knows but very little about them.) Just beyond the beacon at Exmouth is a thicket of brambles, a sort of sedge, below which is a very pleasant walk, extending towards the cliffs, and on the bramble blossoms I captured a splendid ♂ *Andrena florea*, apparently just out, it being in such fine condition: this was a good beginning. A little further on took a beautiful ♀ *Halictus lugubris*; this I consider to be a second brood, as she was not the least worn. On a white-washed wall, belonging to the coast-guard station, I took a most beautiful *Elachista*, new to me; it is about the size of *P. Pfeifferella*; it is perhaps a new species. By the side of this wall runs a hedge of *Atriplex portulacoides*, and there is not another hedge or bush near, so I thought it most probable the species was bred from this plant. Well, on we went, till we came to some old lime-kilns, and just by these is a large patch of *Centaurea calcitrapa*, on the flower-heads of which I took *Megachile Willughbiella* and *Saropoda bimaculata*, and just by this place is a pond of fresh water, in which I took *Berosus globosus* and a dozen or so of *Philhydrus melanocephalus*. Leaving this, we moved on towards the high cliffs, and on some bramble blossom I took a specimen of *Halictus sexnotatus* ♂ and *Andrena bicolor* ♀.

The cliffs being rather high, that is from seventy or one hundred feet or more, and the sun was blazing upon us enough to roast us alive, we made our way from this unto a point of rocks which runs out into the sea, which at low water are high and dry. The flat surface of this sandstone rock is carpeted with *Fucus serratus*, and on the sides of the water-worn gullies were scattered over numbers of *Actinea*, all of one species, namely, *Actinea crassicornis*, and its red variety—the latter predominated to a considerable extent. I saw one beautiful greenish specimen which I could not make out. In one of those glorious rock-pools, which Mr. Gosse has so faithfully portrayed, we observed some "odd fish"—some Gobies and a *Cottus bubalis*; (?) I think it was this species, but am not sure. These soon shot away amongst the magnificent fronds of *Laminaria bulbosa*, which hung so gracefully from the sides of this splendid pool; and here and there where the rock projected a little, were growing some *Polysiphonia elongata* and *Ceramium rubrum*, with a patch or two of *Corylina officinalis*, and a few bits of a bright green conferva: this was the drapery which covered

the rocky walls of this beautiful pool. These seen through the clear water in the bright sun-light looked like some fairy-land, and left an impression on the mind which neither of us will soon forget. My friend was so enchanted by this splendid picture, that he was loth to leave it.

Near the cliffs lay some great boulders, which at some time must have fallen from the cliffs, as the waters have worn away the base, and these are worn into queer shapes by the wear and tear of the restless waves. On these it was curious to observe the species, how they kept together; thus on one was nothing else but *Purpurea lapillus*, and on another nothing else but the common *Balanus*, and on another I observed what might be termed the "happy family;" thus *Balani*, *Trochus umbilicatus*, a *Nerite* or two, with a few specimens of *Littorina patula*; and before taking leave of this interesting spot a thought struck me that I had not seen a Zoophyte. Turning to a little shallow pool, I observed a small one, *Laomedea gelatinosa*, with its tiny creeping polypidoms, and bearing their miniature cups. I went down on my knees to see if their little arms were protruding from the tiny urns, but could not see them, so I took out my knife and cut some off, and brought them home to examine the species.

Being well satisfied with our shore visit, we ascended the cliffs, which was rather a difficult operation, but at length we got up, and sat ourselves down to have some luncheon, and view the beautiful scene beneath; and in the distance, just opposite Dawlish, about a mile from the land, lay one of old England's "wooden walls," 'The Blenheim.' After satisfying the 'inner man,' we proceeded along the cliffs, and soon came to a bramble bush or two; here the net went to work again, and took *Sphecodes ephippia* and a ♀ *S. subquadrata*, and a specimen of *Halictus leucopus* ♂(?) The males of *H. leucozonius* were swarming on the brambles and rag-wort flowers. I saw four specimens only of *Colias edusa*, and these were as wild as possible, and directly I attempted to take them, they flew over the face of the cliffs.

Having pretty well tired ourselves, and as it was drawing towards evening, we retraced our steps back to Exmouth, from thence over to Starcross, and by rail home, being well satisfied with our day's excursion, and the collections we had made.

Exmouth, August 19th., 1858.

Tiger Moths.—Last summer I caught a pair of very beautiful moths, some of the Tiger Moths I believe, and having killed them with sulphur matches, found that the hind wings had lost their fine ruby red colour—probably, as they were left in the smoke for some hours, from the sulphurous acid generated. Can you tell me of any method of restoring the colour? I feared the application of an alkali might destroy the bluish black of the other parts of the insect.—CYMRO.

Acherontia atropos.—A fine specimen of the Death's Head Hawk Moth was taken last month by Mr. J. C. Browne, in a field near here, and yesterday a boy brought me three chrysalides of the same moth, which he had found while lifting potatoes.—W. G. GIBSON, Dumfries, October 15th., 1858.

Catocala nupta.—I can confirm what Mr. Crewe says of this insect flying about in the day-time, and fast they do fly. I used to see them thus at East Garston, near Lambourne, Berkshire, some five-and-twenty years ago; starting off, if you approached them, from some grey old lichen-covered barn-door or bridge, to which their grey colour, when the upper wings are closed over the lower, closely assimilates. They always, however, gave me the idea of only flying about thus when alarmed, and not of their own accord for pleasure or food.—F. O. MORRIS, Nunburnholme Rectory, November 2nd., 1858.

Stay at Home.—I have not for a long time seen a more useful paper than the short and homely one with the above title, by Mr. Crewe, in the October number. Every entomologist must agree with him, and say "crede experto." Many is the time one has missed good things, or at all events good specimens, at one's own door, by going to a distance in search of something better. How often too are good specimens wasted, or rather how often have they been, by being dried up before the day is over, though this may be safely avoided by the adoption of the method recommended in the "Aphorismata" published with my "History of British Butterflies." How often too, while going to a distance for "scarce articles," not perhaps after all to be obtained, are the common species that might be caught in one's own garden, or the adjoining lane or field, left until it is too late to obtain good specimens, or any at all, and the cabinet is disfigured by worn-out or badly-set ones, while it might have been set off by fresh and fine ones; little or nothing having been after all gained to make amends, by the acquisition of "Crewe's Catalogue of Rarities," with which the present Mr. Crewe is right in having nothing to do to the disparagement of home treasures.—F. O. MORRIS, October 14th., 1858.

Eupithecia assimilata.—For the last two or three years I have devoted a good deal of time to observing the habits of the larvæ of the genus *Eupithecia*, and a more interesting family it is impossible to conceive. I have bred and taken the larva of some twenty species. I had never seen the larva of *E. assimilata*, and so yesterday I thought I would try if I could not turn up this species in Derbyshire, and following Mr. Logan's advice, I set to work inspecting the black currant bushes in the kitchen garden. I had only been at work half an hour when the dinner-bell rung, but had the satisfaction of taking home a bag of sixteen. I have been at work again to-day, and not without success. Some of the larvæ are still quite small.—H. HARPUR CREWE, Breadsall Rectory, near Derby, October 14th., 1858.

Acronycta alni.—I have just become the fortunate possessor of two pupæ of this rare insect. The larvæ were both found by my father in July, in this parish, (Breadsall,) crawling up some gate-posts. They spun up immediately just on the surface of the earth.—Idem.



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